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JOURNAL INFORMATION

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(Editorial policy continued on inside back cover)

Cover Photo: *Pseudacris ocularis* (see p 96).

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Josie Chaffin

**2023-2024 Caledon State Park Survey
Caledon State Park
King George County, Virginia**

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Abstract: Caledon State Park is a 1,044 hectare park in King George County with river, wetlands, woodland habitats, and fields. The survey occurred on 3 June 2023 and 8 June 2024 had 33 participants and 23 in attendance respectively. There were 363 individuals of 29 species of herpetofauna recorded (14 amphibians and 15 reptiles). Of the 29 species documented, one was a Virginia Department of Wildlife Resources Tier IIIa species (Woodland Box Turtle) another was a Tier IVc species (Eastern Hog-nosed Snake). Future small-scale, long-term surveys of the park could uncover additional records for King George County.

Key words: Herpetological Survey, Caledon State Park, King George County, VDWR Tier IIIa, Woodland Box Turtle, VDWR Tier IVc, Eastern Hog-nosed Snake

INTRODUCTION

Caledon State Park is a 1,044-hectare (2,579-acre) park in the Coastal Plain of Virginia (Tobey, 1985) which has features such as sandy soils, extensive marshes, and lower elevations (Mitchell, 1999). There are a variety of habitats present at Caledon: creeks, ponds, lakes, open fields, forests, and edge habitats. Caledon Natural Area was established in 1974 and is distinguished by its tulip poplar and oak dominated upland forest (National Park Service, 2016) in 2012 it became a state park (Johnson, 2012). Caledon State Park's ownership has

changed over the years. It was first assigned ownership in 1654. It has changed hands over the years until John Alexander purchased it in 1659. It stayed in that family until it was donated by Ann Hopewell Smoot in 1974. She said that her husband wished to donate it to the state of Virginia to preserve the lands natural beauty and history (Johnson, 2012).

The 2023-2024 Caledon State Park Survey was held at Caledon State Park in King George County. This was the third time the Virginia Herpetological Society (VHS) conducted a survey in this park. The first time was in 1983 (Hill and Pierson, 1986) and second was in 2013 (Perry, 2013). As of publishing, there are only

50 species of herpetofauna that had been documented in King George County (VHS database, 2024). Caledon State Park was selected for a third survey to compare what was found in previous years. It was also selected because many of the counties surrounding King George have 60 species. There could be additional species documented as well. Many species that were expected, but not found in the 1983 survey are still outstanding county records: *Gastrophryne carolinensis* (Eastern Narrow-mouthed Toad), *Pseudacris feriarum* (Upland Chorus Frog), *Eurycea guttolineata* (Three-lined Salamander), *Cemophora coccinea copei* (Northern Scarletsnake), *Farancia erytrogramma erytrogramma* (Common Rainbow Snake), *Lampropeltis rhombomaculata* (Northern Mole Kingsnake), *Lampropeltis triangulum* (Eastern Milksnake), and *Pantherophis guttatus* (Red Cornsnake) (Hill and Pierson, 1986).

SURVEY SITES

The study sites for the 2023-2024 Caledon State Park Survey are listed below and can

be seen in Figure 1.

Site 1 – Woodland Area (38°20'3.37"N, 77° 8'37.04"W). This site started at the Fern Hollow trailhead and continued around the Poplar Grove and Lauren Glen trail loops before coming back to the parking area. This area included streams and woodland habitat.

Site 2 – Jones Pond Loop and Natural Area (38°21'31.55"N, 77° 8'37.73"W). This site started at the Jones Pond Loop trailhead and followed along the Potomac around to the Natural Area and back. This area included edge habitat, river habitat, ponds, marshy areas, and woodland habitat.

Site 3 – Boyd's Hole and Caledon Marsh (38°20'37.01"N, 77° 9'41.95"W). This site began at the trailhead of Boyd's Hole and continued around to the Caledon Marsh and back. This area included edge habitat, river habitat, ponds, marshy areas, and woodland habitat.



Figure 1. Map showing Caledon State Park and survey sites during the survey.

METHODS AND MATERIALS

The pre-survey occurred Monday, 22 May 2023 and only one group surveyed. During the 2023 main survey on Saturday, 3 June 2023, participants were split into three groups. The 2024 survey was on Saturday, 8 June 2024 and participants were split into three groups. Prior to surveying, participants were informed about proper handling, surveying, and disinfection techniques. Methods used to find animals included: capturing by hand or net, visual observation, listening for calling anurans, and flipping rocks, logs, and boards. Group leaders filled out standardized survey data sheets to record all animals encountered. Data sheets included information on the physical

environment, weather, animal health, and microhabitat. Other data collected included: photographs of rare species, presence of disease or injury, age, and sex. Data sheets were deposited in the VHS archives.

On Monday, 22 May the temperature was 21.1°C with a sunny sky and no precipitation. On Saturday, 3 June the temperature was 23.3°C to 27.2°C with mostly sunny skies. On Saturday, 8 June 2024 the temperature was 20°C to 27.8°C and weather conditions were partly cloudy to sunny skies. There was a total of 154.5 person hours per survey effort for 2023 and 120 person hours per survey effort for 2024. There was a combined total of 274.5 hours between all surveys (Table 1).

Table 1. Summary of survey effort per site between 2023 surveys and 2024 survey.

| Survey Site | No. of Surveyors | Hours | Estimated Person Hours |
|----------------|------------------|-------|------------------------|
| 2023 | | | |
| 1(pre-survey) | 2 | 3 | 6 |
| 1 | 9 | 5.5 | 49.5 |
| 2 | 11 | 4.5 | 49.5 |
| 3 | 11 | 4.5 | 49.5 |
| Sub-Total | | | 154.5 |
| | | | |
| Survey Site | No. of Surveyors | Hours | Estimated Person Hours |
| 2024 | | | |
| 1 | 9 | 5 | 45 |
| 2 | 8 | 5 | 45 |
| 3 | 6 | 5 | 30 |
| Sub-Total | | | 120 |
| Combined Total | | | 274.5 |

RESULTS

There were 363 individual animals of 29 species of herpetofauna recorded - 14 amphibians (Table

2) and 15 reptiles (Table 3). Common and scientific names below and throughout the paper adhere to the Society for the Study of Amphibians and Reptiles (SSAR) Committee on Standard English and Scientific Names (Crother, 2017).

Table 2. Summary of the number of amphibians observed at each site.

| Sites | 1 (Pre-survey) | 1 (2023) | 2 (2023) | 3 (2023) | 1 (2024) | 2 (2024) | 3 (2024) | |
|-------------------------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| Species | | | | | | | | Total |
| <i>Acris crepitans</i> | 6 | 5 | 10 | 3 | | 1 | | 25 |
| <i>Ambystoma maculatum</i> | | | 3 | | | | | 3 |
| <i>Ambystoma opacum</i> | | | 19 | | | 17 | 1 | 37 |
| <i>Anaxyrus a. americanus</i> | 2 | 14 | 3 | 3 | 9 | | 1 | 32 |
| <i>Anaxyrus fowleri</i> | 1 | 3 | | | 1 | 1 | | 6 |
| <i>Eurycea bislineata</i> | | 1 | | | | | 2 | 3 |
| <i>Hemidactylium scutatum</i> | | | | | | | 1 | 1 |
| <i>Hyla chrysoscelis</i> | 11 | 6 | | | 3 | | 2 | 22 |
| <i>Lithobates catesbeianus</i> | 5 | 1 | 1 | 1 | | | | 8 |
| <i>Lithobates clamitans</i> | 7 | 19 | 10 | | 12 | 5 | 1 | 54 |
| <i>Lithobates palustris</i> | | 2 | | | 2 | | 2 | 6 |
| <i>Lithobates sphenoccephalus</i> | 3 | 8 | | 2 | 3 | 5 | 3 | 24 |
| <i>Notophthalmus v. viridescens</i> | | | | 1 | | | | 1 |
| <i>Pseudacris crucifer</i> | | | | | 1 | | | 1 |
| Total | 35 | 59 | 46 | 10 | 31 | 29 | 13 | 223 |

Table 3. Summary of the number of reptiles observed at each site

| Sites | 1 (Pre-survey) | 1 (2023) | 2 (2023) | 3 (2023) | 1 (2024) | 2 (2024) | 3 (2024) | |
|--------------------------------------|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| Species | | | | | | | | Total |
| <i>Agkistrodon contortrix</i> | | | 1 | | | | | 1 |
| <i>Carphophis a. amoenus</i> | | 9 | 10 | 4 | 13 | 8 | 4 | 48 |
| <i>Chrysemys p. picta</i> | | | 1 | | | | 1 | 2 |
| <i>Coluber c. constrictor</i> | | | | 1 | | 4 | | 5 |
| <i>Diadophis puntactus edwardsii</i> | | | | | 1 | | | 1 |
| <i>Heterodon platirhinos</i> | | | | | | 1 | | 1 |
| <i>Kinosternon subrubrum</i> | | | | | | 1 | 1 | 2 |
| <i>Nerodia s. sipedon</i> | | | | 1 | 1 | | | 2 |

Caledon State Park Surveys

| | | | | | | | | |
|------------------------------------|---|----|----|----|----|----|----|-----|
| <i>Pantherophis alleghaniensis</i> | | 1 | 3 | 3 | | 1 | | 8 |
| <i>Plestiodon fasciatus</i> | 7 | 14 | 8 | 7 | 9 | 3 | 5 | 53 |
| <i>Plestiodon laticeps</i> | | 1 | 1 | 2 | 2 | | 3 | 9 |
| <i>Pseudemys rubriventris</i> | | | | | | | 1 | 1 |
| <i>Scincella lateralis</i> | 1 | | | 1 | | | | 2 |
| <i>Storeria dekayi</i> | | | | | | | 1 | 1 |
| <i>Terrapene c. carolina</i> | | | 1 | 2 | | | 1 | 4 |
| Total | 8 | 25 | 25 | 21 | 26 | 18 | 17 | 140 |

ANNOTATED CHECKLIST

Note: for the accounts below numbers in parentheses are animals recorded at each site listed

Amphibians

1. *Acris crepitans* (Eastern Cricket Frog). A total of 25 *A. crepitans* were found at sites 1 pre-survey(6), 1(5), 2(10), 3(3) in 2023 and 2(1) in 2024. All individuals were either seen or heard calling around bodies of water .
2. *Ambystoma maculatum* (Spotted Salamander). Three *A. maculatum* were found at site 2 under rotten logs in 2023.
3. *Ambystoma opacum* (Marbled Salamander). Thirty-seven *A. opacum* of different age classes were found at sites 2(19) in 2023 and sites 2(17) and 3(1) in 2024 under rotten logs. One of the adults found at site 2 in 2024 had a bifurcated tail. Bifurcated tails are caused by an injury (but not full loss of a tail/digit) and new tissue regrows at that site. It is not common but has been documented in various *Ambystoma* species (Gibson, 2023).



4. *Anaxyrus a. americanus* (Eastern American Toad). A total of 32 *A. a. americanus* were found across all sites, except site 2 in 2023. On the pre-survey and at site 1 in 2023 and sites 1 and 3 in 2024 they were seen hopping in a woodland habitat. At site 2 (2023) they were found under a log and at site 3 (2023) they were found in a pond streambed.
5. *Anaxyrus fowleri* (Fowler's Toad). Six *A. fowleri* were seen at site 1 pre-survey(1) and site 1(3) in 2023 and sites 1(1), and 2(1) in 2024. They were all found hopping along the forest floor in a woodland habitat. One of the individuals found at site 1 made a release call.
6. *Eurycea bislineata* (Northern Two-lined Salamander). Three *E. bislineata* were found at sites 1(1) in 2023 and 3(2) in 2024. All were found under small logs by a stream.



7. *Hemidactylium scutatum* (Four-toed Salamander). In 2024, a single *H. scutatum* was found under a log at site 3.
8. *Hyla chrysoscelis* (Cope's Gray Treefrog). Twenty-two *H. chrysoscelis* were found at sites 1 pre-survey (11) and 1(6) in 2023 and 1(3) and 3(2) in 2024. They were heard calling at sites 1 during the pre-survey, 2023, and 2024 surveys. They were also seen in woodland habitat during the pre-survey and on top of a log at site 3 in 2024.
9. *Lithobates catesbeianus* (American Bullfrog). In 2023, a total of eight *L. catesbeianus* were found calling in a wetland habitat across sites 1 pre-survey(5), 1(1), 2(1), and 3(1). None were observed in 2024.
10. *Lithobates clamitans* (Green Frog). *Lithobates clamitans* was the most encountered amphibian during the survey. Fifty-four *L. clamitans* were found across all sites except site 3 in 2023. Individuals were heard calling at sites 1 pre-survey (7) and 1(6) in 2023. *Lithobates clamitans* were observed on the edges of a wetland at sites 1(13) and 2(10) in 2023 and 1(12), 2(5), and 3(1) in 2024.

11. *Lithobates palustris* (Pickerel Frog). Six *L. palustris* were seen on the bank of a small stream or creek at site 1(2) in 2023 and sites 1(2), and 3(2) in 2024.

12. *Lithobates sphenoccephalus* (Coastal Plains Leopard Frog). A total of 24 *L. sphenoccephalus* were found across all sites, but site 2 in 2023. Individuals were found near bodies of water at sites 1 pre-survey(3), 1(6), 3(2) in 2023 and sites 1(1), 2(5), and 3(3) in 2024. One individual at site 1 was seen hopping within a fern grove not immediately close to water. Two other individuals were found at site 1 under a log.



13. *Notophthalmus v. viridescens* (Red-spotted Newt). A single *N. v. viridescens* was found at site 3 under a log in 2023.
14. *Pseudacris crucifer* (Spring Peeper). In 2024, a single *P. crucifer* was found at site 1 on land in woodland brush just off the trail.

Reptiles

15. *Agkistrodon contortrix* (Eastern Copperhead). A single *A. contortrix* was found at site 2 next to a log in 2023.



16. *Carphophis a. amoenus* (Eastern Wormsnake). Forty-eight *C. a. amoenus* were found at all sites, except during the pre-survey in 2023. They were found under a rock or log at sites 1(9), 2(10), 3(4) in 2023 and sites 1(13), 2(8), and 3(4) in 2024.

17. *Chrysemys p. picta* (Eastern Painted Turtle). Two *C. p. picta* were found at sites 2 in 2023 and 3 in 2024. The individual found at site 3 was noted to be swimming in a marsh.

18. *Coluber c. constrictor* (Northern Black Racer). Five *C. c. constrictor* were found at sites 3(1) in 2023 and 2(4) in 2024. All the individuals found were on land near a body of water.

19. *Diadophis punctatus edwardsii* (Northern Ring-necked Snake). In 2024, a single *D. punctatus edwardsii* was found at site 1 under a log near a drying vernal pool.

20. *Heterodon platirhinos* (Eastern Hog-nosed Snake). In 2024, a single *Heterodon platirhinos* was found at site 2 on top of leaf litter. This individual was a melanistic form.

21. *Kinosternon subrubrum* (Southeastern Mud Turtle). Two *K. subrubrum* were found at sites 2 and 3 in 2024. At site 2, an adult male was seen basking on a clump of marsh grass. The individual found at site 3 was under a log near water.

22. *Nerodia s. sipedon* (Northern Watersnake). Two *N. s. sipedon* were found at sites 3 in 2023 and 1 in 2024. The individual at site 3 was found in a pond. The *N. s. sipedon* at site 1 was found in a stream and was approximately 0.6 meters long with a stump tail.

23. *Pantherophis alleghaniensis* (Eastern Ratsnake). There were eight *P. alleghaniensis* found at sites 1(1), 2(3), 3(3) in 2023 and 2(1) in 2024. The individual found at site 1 was on a tree over the bank of a stream. Individuals were found out on a log at sites 2(3) and 3(2). The additional *P. alleghaniensis* at site 3 was found in a fern gully. At site 2, in 2024, the individual found was in the middle of the trail.

24. *Plestiodon fasciatus* (Common Five-lined Skink). *Plestiodon fasciatus* was the most abundant reptile observed during the surveys. Fifty-three *P. fasciatus* were found at every site basking on a log, except in two cases. In 2024, an individual at site 2 and 3 were found inside of a log.



25. *Plestiodon laticeps* (Broad-headed Skink). Nine *P. laticeps* were found across five sites: 1(1), 2(1), 3(2) in 2023 and sites 1(2) and 3(3) in 2024. At all the sites *P. laticeps* was seen basking on a tree or log.
26. *Pseudemys rubriventris* (Northern Red-bellied Cooter). In 2024, a single *P. rubriventris* was found at site 3 in a marsh habitat.
27. *Scincella lateralis* (Little Brown Skink). Two *S. lateralis* were found in 2023 during the pre-survey(1) and at site 3(1). Both were seen moving in leaf cover.
28. *Storeria dekayi* (Dekay's Brownsnake). In 2024, a single *S. dekayi* was found at site 3 under a log. It was noted to be in shed.
29. *Terrapene c. carolina* (Woodland Box Turtle). Four *T. c. carolina* were found at sites 2(1), 3(2) in 2023 and 3(1) in 2024. The one at site 2 was a male found in grass. The two *T. c. carolina* found at site 3 were a deceased individual (just the shell) and a male *T. c. carolina* in a dry streambed. The one at site 3 in 2024 was a juvenile male found next to a tree and was missing its right front foot.

DISCUSSION

Caledon State Park was selected to conduct a herpetological survey since it hadn't been surveyed in 10 years (Perry, 2013) and there was the potential for a few new county records (VHS database, 2023). This can be supported by many species being found in the five counties that neighbor King George: Caroline, Essex, Spotsylvania, Stafford, and Westmoreland counties. There is also a variety of optimal habitats located within the park that could support these remaining species such as wetlands, streams, and edge habitats. Combining numbers from the 2023-2024 surveys, 363 individual animals of 29 different species were found (14 amphibians and 15 reptiles). None of the animals found in the 2023-2024 surveys were new records for King George County.

When comparing past surveys of Caledon State Park, in 2013 – 147 individuals of 22 species (11 species of amphibians and 11 species of reptiles) were documented. The herpetological survey conducted in 2013 found what was thought to be seven new county records for King George County: *Lithobates sphenoccephalus*, *Notophthalmus v. viridescens*, *Hyla cinerea*, *Plestiodon laticeps*, *Scincella lateralis*, *Kinosternon subrubrum*, *Chelydra serpentina*, and *Coluber c. constrictor* – 5 of which were also found during the 2023-2024 survey. It should also be noted that the above records, with exception to *Chelydra serpentina*, were observed by Hill and Pierson in 1983 (1986).

In 1983, 39 species were documented (20 species of amphibian and 19 species of reptile) over the course of the year (Hill and Pierson, 1986). Hill and Pierson give a pretty extensive list of animals that were expected to be found that still have not been documented in King George County such as: *Eurycea guttolineata* (Three-lined Salamander), *Gastrophryne carolinensis* (Eastern Narrow-mouthed Toad), *Pseudacris feriarum* (Upland Chorus Frog), *Aspidoscelis sexlineata* (Six-lined Racerunner), *L. rhombomaculata* (Northern Mole Kingsnake), *Farancia e. erythrogramma* (Common Rainbow Snake), *Pantherophis guttatus* (Red Cornsnake), *Lampropeltis triangulum* (Eastern Milksnake),

Cemophora coccinea copei (Northern Scarletsnake) and *Sternotherus odoratus* (Eastern Musk Turtle).

Considering the species that are still yet to be documented above, there is a good chance they could be found in the park. *E. guttolineata* has similar habitat preferences to another species of stream salamander that was found on the survey, *E. bislineata*. *Eurycea guttolineata* prefer rocks and logs in close proximity to streams (Petranka, 1998). There have been documentations of *E. guttolineata* in Stafford and Spotsylvania counties to the west of King George County. Also, *E. guttolineata* has been documented in Caroline and Westmoreland Counties (VaFWIS, 2024) which are to the southeast of King George County.

Gastrophyrne carolinensis has been found in Caroline, Essex, and Westmoreland Counties southeast of King George (VaFWIS, 2024). They shelter under cover objects like logs and rocks and moist soil to burrow into. They also need shallow puddles, ponds, and ditches to breed (Beane et al, 2010). The shelter objects and habitat preferences of this species were present at all sites at Caledon State Park.

Pseudacris feriarum was expected to be found and has similar breeding grounds and habitat preferences to the *P. crucifer* that was found during the survey. Both of these species prefer vernal woodland pools and ditches to breed and woodland habitats under the forest litter or logs (Beane et al, 2010). *Pseudacris feriarum* is likely in King George and is found in the neighboring counties of Spotsylvania and Stafford to the west and Caroline and Westmoreland to the southeast (VaFWIS, 2024).

Aspidoscelis sexlineata is likely in King George County and is found in neighboring counties to the southeast such as: Caroline and Westmoreland (VaFWIS, 2024). Their preferred habitat is grasses within loamy or sandy soil which helps provide cover (Beane et al., 2010) which was habitat present at all sites, especially site 3.

Lampropeltis rhombomaculata is expected in King George County and is found in Spotsylvania to the west and in Caroline, Westmoreland, and Essex counties to the southeast of King George (VaFWIS, 2024). *Pantherophis guttatus* is found in the neighboring counties of Caroline, Westmoreland, and Essex to the southeast (VaFWIS, 2024) and is also assumed to be in King George. *Lampropeltis triangulum* has not been found in any counties surrounding King George but is likely to be found in all (VaFWIS, 2024). The three aforementioned snakes prefer woodland areas and cover objects. They can sometimes occur around moist areas like swamps and wetlands (Linzey and Clifford, 1981). These habitats were found in all sites at Caledon State Park.

Cemophora coccinea copei is known in Caroline County to the southeast and likely in Stafford to the west and Essex and Westmoreland to the southeast (VaFWIS, 2024). *Cemophora coccinea copei* prefers sandy soils to allow it to burrow but can also be found under cover objects (Linzey and Clifford, 1981).

Farancia e. erythrogramma was expected to be found and it prefers aquatic habitats such as streams, vernal pools, and marshy areas near sandy soils (Linzey and Clifford, 1981) – which are present at sites 2 and 3. Sandy/loamy soils were present at all sites. *Farancia e. erythrogramma* has been documented in Essex and Caroline Counties to the southeast (VaFWIS, 2024).

Sternotherus odoratus has similar habitat preferences to the *K. subrubrum* that were found in this survey – ponds and streams where they can forage in the shallows (Beane et al, 2010). This habitat was present at site 3 would be a good place to survey in the future. *Sternotherus odoratus* can be found in counties neighboring King George – Caroline and Westmoreland to the southeast and Spotsylvania and Stafford to the west (VaFWIS, 2024). It should be noted that *S. odoratus* was found at site 3 in 2024, but a voucher photo was not taken. Future surveys at site 3 could uncover this outstanding county record.

To document these species likely found in King George County above, it is recommended that state park staff conduct smaller scale, long-term surveys. Other ways of finding the likely species would be to set coverboards in edge or woodland habitats that could attract *L. rhombomaculata*, *L. triangulum*, and *P. guttatus*. Baited turtle traps and hoops could attract aquatic turtles like *S. odoratus*. Auditory surveys through citizen science programs like FrogWatch USA could uncover *G. carolinensis* and *P. feriarum* during their breeding seasons in the late spring/early summer and early spring respectively.

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Caledon State Park Surveys

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Herpetological Survey at Patrick & Henry Community College in Henry County, Virginia

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Abstract: The campus of Patrick & Henry Community College in Henry County, Virginia, was surveyed from April 2016 to April 2024. During this period, a total of 38 species were found, including 10 anurans, 7 salamanders, 6 turtles, 3 lizards, and 12 snakes. Seven new records for Henry County were observed and here reported.

Keywords: Patrick & Henry Community College, Henry County, Herpetological survey, *Acris crepitans*, *Eurycea guttolineata*, *Pseudotriton m. montanus*, *Chrysemys picta picta*, *Coluber constrictor constrictor*, *Kinosternon subrubrum subrubrum*, and *Sternotherus odoratus*

Introduction

Virginia is one of the most topographically diverse states on the East Coast, defined by its five major physiographic provinces: Coastal Plain, Piedmont, Blue Ridge, Ridge and Valley, and Appalachian Plateaus (Fleming, 2012). These provinces stretch from the Atlantic Ocean to the Appalachian Mountains and offer a wide range of habitats supporting nearly 160 different herpetofaunal species (VHS, 2024). The largest of the Virginia provinces is the Piedmont, comprising about 39 percent of the state (Fleming, 2012). The Piedmont province is characterized by diverse habitats, including wetlands, deciduous hardwood stands, evergreen and mixed forests, and natural pine-hardwood successional stands (Fleming, 2012), which are home to approximately 125 species of herpetofauna (VHS, 2024).

Henry County, located in the southern Piedmont region of Virginia, is known for its rich history, natural beauty, and scenic landscapes, including the Blue Ridge Mountains and Smith River, which offer ample opportunities for outdoor recreation, such as hiking, fishing, and boating. Henry County has a population of approximately 50,000 residents and includes the city of

Martinsville, which serves as the county seat. Martinsville has a historical background in manufacturing and textiles, now complemented by ongoing efforts in revitalization and economic diversification, and is famous for the Martinsville Speedway, a key attraction for NASCAR fans. The community is further characterized by a blend of small-town charm and a commitment to cultural and economic growth, supported by institutions like Patrick & Henry Community College, a small public community college serving approximately 2,500 students.

To date, nearly 70 herpetofaunal species have been identified in Henry County (VHS, 2024), a significant increase from the 14 documented by Tobey (1985) and the 41 recorded by Mitchell & Reay (1999). This increase reflects the ongoing efforts and interest of individuals in learning more about the herpetofauna in this particular geographic region of the Piedmont, including the campus of Patrick & Henry Community College, where we conducted an eight-year herpetological survey beginning in April 2016. The goal of this survey was to catalog the diversity of amphibians and reptiles and to create a better understanding of their use of the diverse habitats available on campus.

Material and Methods

Site Description

Patrick & Henry Community College's campus in Henry County spans approximately 55 hectares, with 12 hectares housing various facilities such as academic buildings, administrative offices, and student service centers. The remaining 43 hectares consist of deciduous hardwood stands, evergreen and mixed forests, and natural pine-hardwood successional stands, as well as 6 kilometers of recreational trails leading to and along the edge of the 70-hectare Martinsville Reservoir. The reservoir is owned and controlled by the city and further managed by the Virginia Department of Wildlife Resources. Additionally, the campus offers a variety of other habitats, including open fields, maintenance and service roads, muddy floodplains, springs, intermittent streams, a stormwater retention pond, and several seasonally flooded pools. Each water habitat is classified using the standard technical wetlands habitat classification following Cowardin et al., 1970.

Study Sites

The college campus survey was conducted at ten primary sites (Figure 1):

Site 1. Main Campus - A 12-hectare area containing academic buildings, administrative offices, and student service centers. The area consists of open grassy habitats with a sparse arrangement of different tree species and asphalt-paved roads and parking lots.

Site 2. Stream Bed - This area begins in a deciduous hardwood forest approximately 14 meters from the campus' softball field and runs parallel to campus behind Philpott Hall, the Learning Resource Center, and West Hall, before ending at the Martinsville

Reservoir. The upper portion of the stream bed is characterized as intermittent, while the lower portion becomes a slow-moving stream before emptying into the reservoir. (R4SB3 - Riverine, intermittent, streambed, cobble-gravel).

Site 3. West Hall Reservoir Bank - Located directly behind West Hall and its adjacent parking lot, this area consists of deciduous hardwoods and progressively slopes downward to the edge of the Martinsville Reservoir.

Site 4. Beaver Creek Campus Trail - This area consists of three trails forming a four-kilometer loop through an evergreen and mixed forest. The trails begin at an adjacent parking lot to West Hall and leads to the edge of the Martinsville Reservoir before looping back towards campus.

Site 5. Patrick & Henry Community College Loop Trail - Located behind Frith Hall, this area consists of a one-kilometer loop around an evergreen and mixed forest stand and through open grassy fields. The loop trail also provides access to several seasonally flooded pools that develop in late winter and early spring. (PEM2C - Palustrine, emergent vegetation, nonpersistent, seasonally flooded).

Site 6. Service Roads - The interconnected dirt roads on campus allow the maintenance department to access various locations. These service roads often develop tire ruts from trucks, utility vehicles, and mowers, which fill with water in late winter and early spring, creating microhabitats for some herpetofaunal species. Additionally, a small stormwater retention pond, fed by runoff from a drainage area along Patriot Avenue, is located off one of these service roads. (PUB3Hr - Palustrine, unconsolidated bottom, mud, permanently flooded, artificial).

Site 7. Young Pine - A clear-cut area defined by a young re-planted loblolly pine (*Pinus taeda*) plantation.

Site 8. Maintenance Trail - The beginning of this trail is adjacent to an open grassy field and runs parallel through a small deciduous hardwood stand along Patriot Avenue before ending at the college's maintenance department building. The area also includes the maintenance department building and the surrounding grounds.

Site 9. Reservoir - A 70-hectare reservoir, owned and controlled by the city of Martinsville and further managed by the Virginia Department of Wildlife Resources. (L1UBh2US - Lacustrine, limnetic-unconsolidated bottom, diked/impounded, littoral-unconsolidated shore).

Site 10. Mature Pine - An area defined by a mature loblolly pine (*Pinus taeda*) plantation and seasonally flooded pools in late winter and early spring. (PEM2C - Palustrine, emergent vegetation, nonpersistent, seasonally flooded).



Figure 1. Map showing survey sites.

Field Methods

The eight-year survey was conducted between April 2016 and April 2024 by two college biology professors and two college students from Patrick & Henry Community

College. Survey techniques included visual encounters, dip netting, road surveys, auditory surveys, artificial coverings, aquatic hoop traps, and crayfish traps. Most sampling was completed using visual encounters by flipping logs, rocks, and artificial coverings during the early to late morning or early afternoon. Dip netting was used to capture frogs and salamanders. Road surveys were

conducted along Patriot Avenue upon arrival on main campus (Site 1) to identify dead on road (DOR) amphibian species killed while crossing the road after rainy nights and/or reptiles using the road to bask. Auditory surveys occurred while walking through the sites in early to late spring to identify frogs calling during mating season. Artificial coverings, including wooden boards (0.5m x 1.5m), metal shelving (1.2m x 0.5m), corrugated metal sheets (2.5m x 1m), and black plastic sheets (0.5m x 1.5m), were randomly used within the surveyed sites.

On three occasions, aquatic hoop nets were deployed to identify aquatic turtles. Four aquatic hoop nets were used along the edge of the reservoir on one occasion, while on two separate occasions, a small stormwater retention pond adjacent to the service road was surveyed using two aquatic hoop nets. Traps were placed perpendicular to the shore, with the mouth completely submerged and a portion of the trap above water. Each trap was baited with canned sardines and checked and removed from the water within 24 hours. Finally, crayfish traps were used in the seasonally flooded pools of the mature

loblolly pine (*Pinus taeda*) plantation. The traps were placed upright in the pools, baited with canned sardines, and checked and removed from the pools within 24 hours.

Results

At the conclusion of our eight-year survey, we documented 38 herpetofaunal species, including 10 anurans, 7 salamanders, 6 turtles, 3 lizards, and 12 snakes. A small population of DWR conservation status tier IVa *Pseudotriton montanus montanus* (Mud Salamanders) was discovered on the campus. One individual of the naturalized *Trachemys scripta elegans* (Red-eared Slider) was observed in the Martinsville Reservoir. Seven new Henry County records were documented, including three amphibians (*Acris crepitans*, *Eurycea guttolineata*, and *Pseudotriton m. montanus*) and four reptiles (*Chrysemys picta picta*, *Kinosternon subrubrum subrubrum*, *Sternotherus odoratus*, and *Coluber constrictor constrictor*). Tables 1 and 2 list species found at each site. An annotated species list follows. Species names follow Crother (2017).

Table 1. Amphibian species found at each site of Patrick & Henry Community College.

| Amphibian Species | Site 1 | Site 2 | Site 3 | Site 4 | Site 5 | Site 6 | Site 7 | Site 8 | Site 9 | Site 10 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Anurans | | | | | | | | | | |
| <i>Acris crepitans</i> | | X | | X | X | X | | | | |
| <i>Anaxyrus a. americanus</i> | X | | | | | | | | X | |
| <i>Anaxyrus fowleri</i> | X | | | X | | X | | X | | |
| <i>Hyla chrysoscelis/H. versicolor</i> | X | | | X | | | | | | |
| <i>Lithobates catesbeianus</i> | X | X | | X | | X | | | | |
| <i>Lithobates clamitans</i> | | | | | | X | | | | |
| <i>Lithobates palustris</i> | | X | | X | | X | | | | |

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|-------------------------------------|---|---|---|---|--|---|--|---|--|---|
| <i>Pseudacris crucifer</i> | X | | | X | | X | | | | X |
| <i>Pseudacris feriarum</i> | X | X | | X | | X | | | | X |
| Salamanders | | | | | | | | | | |
| <i>Ambystoma maculatum</i> | | | | | | X | | | | X |
| <i>Desmognathus fuscus</i> | | X | | | | | | | | |
| <i>Eurycea cirrigera</i> | | X | | | | X | | | | |
| <i>Eurycea guttolineata</i> | X | X | | | | | | | | |
| <i>Notophthalmus v. viridescens</i> | X | X | X | | | X | | X | | X |
| <i>Plethodon cylindraceus</i> | | X | X | X | | | | | | |
| <i>Pseudotriton m. montanus</i> | | X | | | | | | | | |

Table 2. Reptile species found at each site of Patrick & Henry Community College.

| Reptile Species | Site 1 | Site 2 | Site 3 | Site 4 | Site 5 | Site 6 | Site 7 | Site 8 | Site 9 | Site 10 |
|---------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|
| Turtles | | | | | | | | | | |
| <i>Chelydra serpentina</i> | | | | | | X | | | | |
| <i>Chrysemys p. picta</i> | | | | | | X | | | X | X |
| <i>Kinosternon s. subrubrum</i> | | | | | | X | | | | X |
| <i>Sternotherus odoratus</i> | | | | | | | | X | | |
| <i>Terrapene c. carolina</i> | | X | | X | X | X | | | | |
| <i>Trachemys s. elegans</i> | X | | | | | X | | | X | |
| Lizards | | | | | | | | | | |
| <i>Plestiodon fasciatus</i> | X | | | X | | | | X | | |
| <i>Sceloporus undulatus</i> | X | | | X | | | X | | | X |
| <i>Scincilla lateralis</i> | | | | X | | X | | | | |
| Snakes | | | | | | | | | | |
| <i>Agkistrodon contortrix</i> | X | | | | | | | | | |
| <i>Carphophis a. amoenus</i> | X | X | X | X | X | | | X | | X |
| <i>Coluber c. constrictor</i> | | X | | | | X | X | | | |

| | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|--|---|--|---|
| <i>Diadophis punctatus edwardsii</i> | | X | | | | | | | | |
| <i>Heterodon platirhinos</i> | X | | | | | | | | | |
| <i>Lampropeltis rhombomaculata</i> | | | | | | X | | | | |
| <i>Nerodia sipedon sipedon</i> | | X | X | X | | X | | | | |
| <i>Pantherophis alleghaniensis</i> | X | | | X | | X | | X | | X |
| <i>Pantherophis guttatus</i> | X | | | | | | | | | |
| <i>Storeria dekayi</i> | X | | | X | | | | | | |
| <i>Storeria occipitomaculata</i> | X | | | X | | | | X | | |
| <i>Thamnophis s. sirtalis</i> | X | | | | X | | | | | |

Annotated Checklist

Amphibians:

Anurans:

1. *Acris crepitans* (Eastern Cricket Frog)*

Eastern Cricket Frogs were observed in various locations, including the edge of the reservoir, trails, the service road adjacent to the stormwater retention pond, leaf litter, flooded tire ruts, seasonally flooded pools, surrounding pinewood, and the edge of intermittent streams. Their activity period extended from 8 January to 8 November. Calling males were heard from 8 April until 27 July with calling sites including flooded tire ruts, the margin of the stormwater retention pond, and the reservoir's edge. On 23 September 2021, six adults and 38 juvenile frogs were found on the same day, indicating this species is very abundant on campus. Janney et al. (2017) submitted their survey findings of the Eastern Cricket Frog to the Virginia Herpetological Society, marking a record for Henry County.

2. *Anaxyrus a. americanus* (Eastern American Toad)

Eastern American Toads were observed at the edge of intermittent streams, seasonally flooded pools, stormwater retention ponds,

and adjacent to the softball field. Their activity period extended from 15 March to 16 October, with calling sites including the margin of an intermittent stream and a seasonally flooded pool. Tadpoles were observed in a stormwater retention pond, but all tadpoles observed on campus died there. This artificial wetland seems to represent an anthropogenic trap, as it does not retain water long enough for tadpoles to develop into metamorphs. One DOR (dead on road) toad was observed on Patriot Avenue on 15 March 2019. This anuran does not appear to be abundant on campus.

3. *Anaxyrus fowleri* (Fowler's Toad)

Fowler's Toads were observed on the trail adjacent to the reservoir, along the margin of the softball field, on a maintenance trail, and in grassy margins and leaf litter beside these locations. This species was active from 19 April until 27 September. One adult Fowler's Toad was found dead on the road (DOR) inside the campus on 19 April 2017. Seven juvenile toads were found on the reservoir trail on 14 September 2017, representing the highest number of this species seen in one day. This species does not appear to be abundant on campus.

4-5. *Hyla chrysoscelis* (Cope's Gray Treefrog)/*Hyla versicolor* (Gray Treefrog)

Gray Treefrogs were observed on campus very infrequently, likely due to our survey not focusing much effort during their prime breeding time in late May, June, and July. The activity period we observed extended from 29 March until 12 September. One juvenile DOR (dead on road) treefrog was found on 3 September 2020, on a road adjacent to West Hall.

6. *Lithobates catesbeianus* (American Bullfrog)

American Bullfrogs were found along the shore of the reservoir, in stormwater retention ponds, and at the edge of intermittent streams. The observed activity period for this species was from 5 May until 20 September. The stormwater retention pond at site 6 was a breeding location for bullfrogs, as many tadpoles were found there. We did not make many observations of this species on campus, likely due to a lack of suitable habitat and limited surveying during its breeding time in late spring and summer. Despite this, the species is likely common in the area due to the large amount of habitat created by the reservoir.

7. *Lithobates clamitans* (Green Frog)

Green Frogs were only found in the stormwater retention pond at site 6. The observed activity period was from 8 April to 25 July, which also represents the early and late dates of male calling. This species does not appear to be abundant on campus, but this could be due to the lack of surveying in late May and during the summer months.

8. *Lithobates palustris* (Pickerel Frog)

Pickerel Frogs were observed along the shore of the reservoir, in the stormwater retention pond, in leaf litter beside an intermittent stream, and in a drainage channel along a service road. Early and late dates extended from 21 March until 20 September. Males

were heard calling on 29 March 2017 (1600 h and 1620 h), 28 March 2018 (1305 h), and 21 March 2022 (1146 h). We did not make many observations of this frog on campus, but this species is probably common in the area due to the size of the reservoir.

9. *Pseudacris crucifer* (Spring Peeper)

Spring Peepers were found at the margin of the reservoir, in seasonally flooded pools, along the margin of a stormwater retention pond, along the shoreline of intermittent streams, in leaf litter in hardwood forest, and along trails adjacent to these habitats. Spring Peepers were observed active from 3 January through 1 December. Males were observed calling during the later winter/spring breeding season from 3 January through 12 April, with most call records occurring in late February and March. Individual males can be heard calling sporadically in later summer and fall from September to December. Calling sites include seasonally flooded pools, stormwater retention ponds, intermittent streams, and the margin of the reservoir. This is a common species on campus.

10. *Pseudacris feriarum* (Upland Chorus Frog)

Upland Chorus Frogs were found in various habitats, including the margins of stormwater retention ponds, seasonally flooded pools, shores of intermittent streams, trail-side ditches, and flooded road ruts. Their calling habits match these habitats. The activity period for this species coincided with the calling period, as we were unable to catch adults outside of it. The earliest calling date was 3 January, and the latest was 12 April, with most calling records from mid to late February. Freshly deposited egg masses were observed from 19 February to 24 February. Oviposition sites included shallow seasonally flooded pools and shallow tire ruts in a grassy field. On 13 February 2024, a male frog was found unable to sink and swim underwater

due to a bloated body (Figure 2). This species is common on campus.



Figure 2. Frog found on 13 February 2024 with a swollen body.

Salamanders:

11. *Ambystoma maculatum* (Spotted Salamander)

Spotted Salamanders were observed in pine woods surrounding seasonally flooded pools, in seasonally flooded pools, and in shallow tire ruts in a grass field. Very few adults were captured and observed during this survey. Most observations of activity related to this species came from freshly deposited spermatophores and eggs in breeding pools and viewing larvae. The observed activity period for this species was from 30 January to 5 May. Egg laying extended from 30 January until 12 April. The egg masses observed on 30 January 2024 were probably laid on 27 January during a strong rain event that night. This breeding pool was absent of

eggs on 26 January and next checked on 30 January. Egg masses were deposited in seasonally flooded pools and shallow tire ruts in a grass field. One gravid female found on 13 February 2024 was found to be lacking dorsal spots (Figure 3). This species is common on campus, but only in the area surrounding its breeding pools.



Figure 3. Gravid female found on 13 February 2024 lacking dorsal spots.

12. *Desmognathus fuscus* (Northern Dusky Salamander)

The Northern Dusky Salamander was only observed under logs at site 2, yet was the most abundant salamander species recorded in this area. The period of activity for this salamander was between 5 January and 8 December, with many observations occurring between April and October. See Table 3 for measurements taken for this species.

Table 3. Measurements for *Desmognathus fuscus*.

| Age Class | SVL (mm) | TL (mm) | Mass (g) | Comments |
|-----------|----------|---------|----------|----------|
| Adult | 51.60 | 106.50 | 2.653 | |
| Adult | 46.25 | 93.20 | 1.925 | |
| Adult | 31.83 | 63.58 | 0.709 | |
| Adult | 46.29 | 89.45 | 1.788 | |
| Adult | 32.74 | 64.93 | 0.699 | |
| Adult | 30.28 | 58.78 | 0.613 | |

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|----------|-------|--------|-------|-------------------|
| Adult | 25.31 | 49.42 | 0.287 | |
| Adult | 33.40 | 53.30 | 0.719 | |
| Adult | 45.80 | 89.90 | 1.747 | |
| Adult | 43.80 | 79.90 | 1.310 | |
| Adult | 42.80 | 82.70 | 1.623 | |
| Adult | 43.60 | 87.90 | 1.654 | |
| Juvenile | 26.00 | | | tail damaged |
| Adult | 57.10 | 114.00 | 3.463 | |
| Adult | 41.79 | 87.62 | 1.768 | |
| Juvenile | 30.37 | 60.37 | 0.578 | |
| Adult | 66.71 | 117.24 | 5.614 | |
| Adult | 54.20 | 94.70 | 3.910 | |
| Adult | 44.70 | 82.40 | 1.658 | |
| | 35.90 | 60.40 | 0.884 | |
| Adult | 60.20 | 86.40 | 2.839 | |
| | 37.40 | 72.00 | 1.022 | |
| | 41.40 | | | regenerating tail |
| | 37.10 | | | regenerating tail |
| | 29.90 | 56.30 | 0.595 | |
| | | 19.70 | 0.039 | gilled larvae |
| Adult | 56.20 | | | missing tail |
| Adult | 53.50 | 111.60 | 3.413 | |
| Juvenile | 33.20 | 67.80 | 0.777 | |
| Juvenile | 34.90 | 65.10 | 0.890 | |
| Adult | 53.70 | | | missing tail |
| Juvenile | 33.10 | 66.50 | 0.707 | |

| | | | | |
|----------|-------|--------|--------|--------------|
| Adult | 50.70 | 95.60 | 2.365 | |
| Adult | 48.80 | 94.80 | 2.248 | |
| Adult | 51.90 | 97.90 | 2.625 | |
| Adult | 46.40 | | | tail damaged |
| Adult | 45.90 | 83.140 | 1.931 | |
| Adult | 47.70 | 97.90 | 2.624 | |
| | 36.90 | 68.70 | 0.892 | |
| Juvenile | 28.00 | 53.20 | 0.4600 | |
| | 51.80 | | | tail damaged |
| | 53.10 | 85.90 | 3.252 | |
| | 50.40 | | | tail damaged |
| | 61.50 | 123.10 | 5.242 | |
| | 64.50 | 124.50 | 5.879 | |
| | 36.50 | 66.20 | 0.9500 | |
| | 36.80 | 75.10 | 1.162 | |
| | 43.70 | 90.20 | 1.649 | |

13. *Eurycea cirrigera* (Southern Two-lined Salamander)

Southern Two-lined Salamanders were encountered under logs, rocks, and landscape fabric in intermittent streams and the woods surrounding these streams at sites 2 and 6. The early and late dates for this species are 5 January to 19 October. We only observed this species five times, thus we classify it as not abundant on campus.

14. *Eurycea guttolineata* (Three-lined Salamander)*

Three-lined Salamanders were observed under logs and landscape fabric along intermittent streams and in woods beside intermittent streams. The activity period for this species extended from 28 March to 1 November. This species was abundant along intermittent streams and surrounding woods at site 2. This observation signifies what we believe to be the first sighting and documentation of the Three-lined Salamander in Henry County, making it a new county record (VHS archive # 823). See Table 4 for measurements taken for this species.

Table 4. Measurements for *Eurycea guttolineata*.

| Age Class | SVL (mm) | TL (mm) | Mass (g) | Comments |
|-----------|----------|---------|----------|-------------------|
| Adult | 31.59 | | | Tail regenerating |
| Adult | 46.4 | | | Tail regenerating |
| Adult | 40.1 | 99.1 | 1.263 | |
| Adult | 42.5 | 85.5 | 1.177 | |
| Adult | 40.9 | 79.5 | 1.171 | |
| Adult | 56.9 | 134 | 2.932 | |
| Adult | 41.2 | 105.6 | 1.378 | |
| | 35 | 76.1 | .0773 | |
| | 38.7 | 92.4 | .0997 | |
| Adult | 40.4 | 104.5 | 1.235 | |

15. *Notophthalmus v. viridescens* (Red Spotted Newt)

The Red Spotted Newt was observed numerous times between 26 January and 22 November in various locations, including one adult found DOR in a parking lot on the main campus. However, most of the newts documented during our survey were either efts found under logs along the stream bed and reservoir bank or walking the maintenance trail, or adults swimming in the stormwater retention pond or seasonally flooded pools of the mature loblolly pine plantation.

16. *Plethodon cylindraceus* (White Spotted Slimy Salamander)

The White Spotted Slimy Salamander was observed between 3 January and 8 December, with most observations occurring in early to mid-April. Our primary observations were

under logs along the stream bed and reservoir bank of Beaver Creek, and the Beaver Creek Campus Trail.

17. *Pseudotriton m. montanus* (Eastern Mud Salamander)*

The Eastern Mud Salamander was found only at site 2. See Worley et al. (2019) for a full description of this habitat. We found this species from 26 June through 19 October, with observations in all months between the early and late dates. Most observations were made in October. By taking photographs of the dorsal spot patterns, we identified at least seven individuals. We only re-captured the same individual once. This species seems rare on campus and is only found in one specific location. Worley et al. (2019) reported this species as a Henry County record. See Table 5 for measurements taken for this species.

Table 5. Measurements for *Pseudotriton m. montanus*.

| Age Class | SVL (mm) | TL (mm) | Mass (g) | Comments |
|-----------|----------|---------|----------|------------|
| Adult | 44.6 | 75 | 1.347 | Square jaw |
| | 43.4 | 71.8 | 1.145 | |
| | 45.3 | 81.3 | 1.678 | |
| | 50.63 | 87.3 | | |
| | 55 | 94 | | |

Reptiles:**Turtles:****18. *Chelydra serpentina* (Snapping Turtle)**

The Snapping Turtle was observed twice during our survey, on 15 February 2019 and 21 February 2019, near the small stormwater retention pond located along the service road. One of the turtles documented was found dead on arrival (DOA), while the other was observed swimming in the retention pond.

19. *Chrysemys p. picta* (Painted Turtle)*

The Painted Turtle was observed numerous times between 3 January and 1 December. Most of the turtles documented were basking on logs in the reservoir. However, turtles were also observed in or along the stormwater retention pond located off one of the service roads; in or along the edge of the seasonally flooded pool near the mature loblolly pine plantation (one of which was released upon capture in a crayfish trap); or captured and released from turtle traps deployed in the reservoir. Stevens et al. (2017) submitted the Painted Turtle as a new Henry County record.

20. *Kinosternon s. subrubrum* (Southeastern Mud Turtle)*

The Southeastern Mud Turtle was primarily observed between 16 February and 8 April, with one additional observation made on 1

August 2018. Turtles were found along the edge of the service road near the stormwater retention pond and basking along the edge of the seasonally flooded pool near the mature loblolly pine plantation, where one was released after being captured using a crayfish trap. Gibson and Worley (2018) submitted the Southeastern Mud Turtle as a Henry County record.

21. *Sternotherus odoratus* (Eastern Musk Turtle)*

The Eastern Musk Turtle was observed on 12 June 2019 along the trail near the maintenance building. This observation signifies what we believe to be the first sighting and documentation of the Eastern Musk Turtle in Henry County, thus making it a new county record (VHS archive # 824).

22. *Terrapene c. carolina* (Woodland Box Turtle)

The Woodland Box Turtle is a commonly seen turtle in Henry County. During our survey, we observed the turtle between 21 April and 14 October in the woods near the intermittent stream bed and Patrick & Henry Community College Loop Trail, along the Beaver Creek Campus Trail and the edge of the service road.

23. *Trachemys s. elegans* (Red-Eared Slider)

The Red-Eared Slider was observed between 4 February and 7 November, with many of the turtles basking on logs in the reservoir. Other observations include 8 June 2021, when the turtle was found in the quad on the main campus, likely lost while trying to find a location to lay eggs, and another on 10 April 2023 along the service road near the drainage channel for the stormwater retention pond.

Lizards:

24. *Plestiodon fasciatus* (Common Five-Lined Skink)

The Common Five-Lined Skink was observed multiple times during our survey, most commonly recorded between 20 April and 14 September. Observations during this period included skinks basking on the outside of buildings, on sidewalks, and in parking lots on campus, as well as on trees and stumps along the Beaver Creek Campus Trail and Maintenance Trail.

25. *Sceloporus undulatus* (Eastern Fence Lizard)

The Eastern Fence Lizard was commonly observed basking between 29 March and 8 November at various locations, including the parking lot of the main campus, wood scraps at the softball field, and trees and logs along the Beaver Creek Campus Trail and young re-planted loblolly pine plantation.

26. *Scincilla lateralis* (Little Brown Skink)

Little Brown Skinks were observed between 29 March and 3 November. These skinks were commonly found in leaf litter along the Beaver Creek Campus Trail, with one actively pursuing a harvestman during a 3 May 2017 observation. Another Little Brown Skink was observed on the service road near the mature loblolly pine plantation.

Snakes:

27. *Agkistrodon contortrix* (Eastern Copperhead)

There was only one sighting of an Eastern Copperhead, although the snake is relatively common in the county. The observation was made on 23 August 2017, and the snake was found DOR on Patriot Avenue.

28. *Carphophis a. amoenus* (Eastern Wormsnake)

Eastern Wormsnakes were primarily observed under logs or under the bark of logs in woods along the stream bed, reservoir trails, reservoir bank, maintenance trail, and mature loblolly pine plantation. The snake was also discovered under metal signage at the softball field. Several observations were made in early to mid-April, as well as on 18 September 2018 and 16 October 2018.

29. *Coluber c. constrictor* (Northern Black Racer)*

The Northern Black Racer was observed between 28 March and 16 July, basking in leaf litter by the service road and under corrugated metal sheets located in the young re-planted loblolly pines and intermittent stream bed. Martin et al. (2019) submitted the Northern Black Racer as a new Henry County record.

30. *Diadophis punctatus edwardsii* (Northern Ring-Necked Snake)

The Northern Ring-Necked Snake was observed on 20 September 2018, 6 October 2021, and 21 April 2023 under black landscape fabric situated along the intermittent stream bed.

31. *Heterodon platirhinos* (Eastern Hog-nosed Snake)

On 24 May 2021 and 6 October 2023, adult Eastern Hog-nosed Snakes were observed on campus basking in the quad and near West Hall. Both exhibited the patterned color phase.

32. *Lampropeltis rhombomaculata* (Northern Mole Kingsnake)

An adult Northern Mole Kingsnake was observed and photographed by Kaloyan Ivanov of the Virginia Museum of Natural History on 5 April 2023 along the service road.

33. *Nerodia sipedon sipedon* (Northern Watersnake)

The Northern Watersnake was observed from January 8 to November 10, with the majority of sightings occurring between April and June. These observations were primarily along the reservoir bank, in a stream running under the service road, and beneath black landscape fabric along the intermittent stream bed.

34. *Pantherophis alleghaniensis* (Eastern Ratsnake)

The Eastern Ratsnake is common in Henry County, and this snake was observed numerous times during our survey, between 6 April and 7 October. The locations of our observations include the main campus, where it was found DOR near West Hall, in a bush curled up in an abandoned bird's nest containing eggs, and in the quad. Additional sightings were noted under a wooden board (used as artificial cover) on the reservoir trail, crossing the reservoir trail, basking along the service road, and within the mature loblolly pine plantation.

35. *Pantherophis guttatus* (Red Cornsnake)

On 13 October 2021, a Red Cornsnake was found DOR on Patriot Avenue.

36. *Storeria dekayi* (Dekay's Brownsnake)

Dekay's Brownsnake was found on 4 September 2018 under a log on the Beaver Creek Campus Trail and under wood debris on 20 May 2019 at the softball field.

37. *Storeria occipitomaculata* (Red-Bellied Snake)

Red-Bellied Snakes were found on three separate occasions during our survey. The first observation was on 16 October 2018 under a log on the maintenance trail, while the subsequent sightings were made on 3 June 2019 under metal signage near the softball field, and on 22 March 2022 under a log on the Beaver Creek Campus Trail.

38. *Thamnophis s. sirtalis* (Eastern Garter Snake)

The Eastern Garter Snake was observed twice, once behind the Walker building on the main campus on 17 April 2019 and once on 10 June 2019, basking in the middle of the Patrick & Henry Community College Loop Trail.

*** Sighting marks new Henry County records.**

Discussion

Over an eight-year period, we documented 38 species, including 17 species of amphibians (10 anurans and 7 salamanders) and 21 species of reptiles (6 turtles, 3 lizards, and 12 snakes) on the Patrick & Henry Community College campus. Several long-duration studies on amphibians have been conducted nearby in the City of Danville and Pittsylvania County, to the east of the community college campus. These studies allow for a simple comparison of species lists with possible inferences as to why they may differ.

In a 23-year study conducted in the City of Danville, Gibson (2023) found 14 species of anurans, and in a 20-year study in Pittsylvania County, Gibson and Sattler (2020) found 13 species of anurans. The two studies observed all the same species we found except in the City of Danville, where Gibson (2023) documented *Gastrophryne carolinensis*, *Hyla cinerea*, *Lithobates sphenoccephalus utricularius*, and *Scaphiopus*

holbrookii. Gibson and Sattler (2020) documented *Gastrophryne carolinensis*, *Lithobates sphenoccephalus utricularius*, and *Scaphiopus holbrookii* in Pittsylvania County. These additional species of anurans found to the east may reflect the properties in the City of Danville and Pittsylvania County being larger and more varied in types of habitats. *Hyla cinerea* was probably introduced, and the westward range of *Lithobates sphenoccephalus utricularius* seems to end before entering Henry County. *Gastrophryne carolinensis* is documented within Henry County and to the northwest in Franklin County, and *Scaphiopus holbrookii* is found to the north and east; perhaps the community college campus does not have the proper breeding habitat for these species, which is why we did not find them. *Lithobates sylvaticus* has been verified in Henry County; however, we did not find it, likely reflecting the lack of proper breeding habitat.

In the City of Danville, Gibson (2023) documented seven species of salamanders, the same as this study; however, he documented *Ambystoma opacum*, whereas we documented *Pseudotriton montanus montanus*. Sattler and Gibson (2020) documented 11 species of salamanders, including *Ambystoma opacum*, *Ambystoma talpoideum*, *Gyrinophilus porphyriticus porphyriticus*, *Plethodon cinereus*, and *Pseudotriton ruber ruber*. The difference in species lists likely reflects the lack of proper breeding habitat on our campus. The absence of *Plethodon cinereus* on campus, however, escapes our explanation. *Desmognathus monticola*, *Desmognathus kanawha* (= *D. quadramaculatus*), and *Hemidactylium scutatum* are found in Henry County but were not documented during our survey. *D. monticola* and *D. Kanawha* (= *D. quadramaculatus*) are more associated with higher altitudes and cool streams, and *H. scutatum* needs a breeding habitat that is not found on our campus.

In 23 years of observing reptiles at Dan Daniel and Anglers parks in the City of Danville, Gibson has observed a similar herpetofauna to what has been found on the Patrick & Henry Community College campus, with a couple of exceptions. In the City of Danville, *Pseudemys concinna concinna* is common, whereas it is not found on our campus, due to the lack of a large river habitat favored by this species. *Aspidoscelis sexlineata* is also found in the city and is documented in Henry County but was not found in our survey. Corn Snakes and Red-bellied Snakes, which we have found on campus, have not been found at Dan Daniel nor Anglers parks, but Queen Snakes and Rough Green Snakes have. We have yet to document Queen Snakes, likely due to a lack of appropriate habitat. Green Snakes are likely on campus but have yet to be observed. *Plestiodon laticeps* is documented for the county but was not observed in our survey. *Lampropeltis getula*, *Tantilla coronata*, and *Virginia valeriae valeriae* have all been documented in Henry County; however, they have eluded us. From personal observations of this region, Eastern Kingsnakes are rare to find. The habitat on campus does not appear to be similar to where we usually find Southeastern Crowned Snakes. We offer no reason why Smooth Earthsnakes were not found.

We encourage other learning institutions to conduct herpetofaunal surveys of their property. Not only would this be a good learning activity for students, but it would also help to draw attention to biological diversity and critical habitats on institutional property. These actions might make future herpetologists and encourage administrators to consider reptiles and amphibians and their habitats when making decisions on maintenance and construction.

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Five years of Opportunistic Surveys in Sussex County, Virginia 2020-2024

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Abstract: Big Woods Wildlife Management Area, Flippo-Gentry Wildlife Management Area, and Big Woods State Forest are all large, adjacent tracts of public land in Sussex County. Multiple surveys were conducted at these lands from 2020 to 2024. Numbers of amphibians and reptiles were recorded during these surveys. As part of a larger effort on the amphibians of Virginia, we also recorded SVL, weight, and natural history information on the species encountered. A total of 47 species (22 anurans, 6 salamanders, 9 snakes, 7 turtles and 3 lizards) were observed. While not all observed on the same date, 22 anurans from one site are the most reported in Virginia. The large numbers of some species relatively rare in the state (*Anaxyrus quercicus* and *Pseudacris ocularis*) is equally impressive. These properties preserve a large amount of the anuran biodiversity in southeastern Virginia, highlighting their importance for wildlife in general and amphibians in particular.

Key Words: Big Woods Wildlife Management Area, Flippo-Gentry Wildlife Management Area, Big Woods State Forest, Anuran Diversity, *Anaxyrus quercicus*, *Pseudacris ocularis*.

INTRODUCTION

Big Woods State Forest (BWSF), Big Woods Wildlife Management Area (BWWMA), and Flippo-Gentry Wildlife Management Area (FGWMA, formerly the Parker's Branch Tract of BWWMA) are all large adjacent tracts of land in Sussex County. Big Woods State Forest consists of 972 hectares and was the first state forest to be established in southeast Virginia. It was previously used for timber production by International Paper. It was acquired by The Nature Conservancy in 2006, then in 2010 by Virginia as part of a 1780 hectare purchase which was used to create Big Woods State Forest and Big Woods WMA. Big Woods WMA consists of almost 900 hectares. Flippo-Gentry WMA was acquired in 2016 from the Nature Conservancy and consists of almost 800 hectares. They consist primarily of pine savanna forests and wetlands. They are being managed to bring back *Pinus palustris* (Longleaf Pines) to improve the habitat for

the federally endangered *Dryobates borealis* (Red-cockaded Woodpecker), and other pines for sustainable timbering. The area and its history was described by Perry (2018) which details a VHS survey of the area in 2017. In that survey, they found nine anuran species, nine salamanders, five snakes, eight turtles and two lizard species. However, that represents only 47% of the amphibians and 43% of the reptiles documented for Sussex County. Their survey was in late April and early May. The goal of the present survey to the same area was to determine if additional species could be found at other times of the year. Many anurans and salamanders are difficult to find outside the breeding season, and the season varies by species. We wanted to see how many of the same, and different, species could be found earlier and later in the year. In addition, our surveys were to gather quantitative and natural history data on amphibians, and anurans in particular, as part of a larger work in progress on the amphibians of Virginia. Many anurans are

found in abundance only in southeastern Virginia. These areas constitute a large tract of public lands in this area.

MATERIALS AND METHODS

In 2020 trips made to BWSF and BWWMA occurred on 4 June and 18-19 June 2020. In 2021, trips were made on 22 January, 27 February, 6, 12 and 27 March, 9 and 30 April, 29 May, 22 June, 9 July, and 15 October usually after a rain event. In 2023 a trip was made from 22-23 June after a significant rain event. In 2024 trips were made on 27 January, 2 and 10 February, 6, 13, and 27 March, 9 May, 25 and 30 July, and 3 and 8 August. Roads within BWSF and BWWMA were driven, listening for calling anurans, both by day and some evening surveys. In wooded areas, cover objects such as logs were overturned searching for terrestrial salamanders, and rocks in streams and on the

shoreline were overturned looking for stream-side salamanders. Roads were driven during the daytime and nighttime searching for animals crossing roads. Vernal pools were searched during the daytime and night looking for anurans, particularly those with choruses of calling males. Several minnow traps were set in Assamoosick Swamp in the Flippo-Gentry WMA in June 2020. Animals were examined for any signs of disease or parasites, many were measured and photographed, and all were released at the site of capture. Common and scientific names used follow Crother et al. (2017).

We used the same sites as Perry (2018), so see that reference for site descriptions. Figure 1 gives the locations of sites 1-5 in Big Woods WMA and State Forest and Figure 2 gives the location of sites 6-7 in Filippo-Gentry WMA.

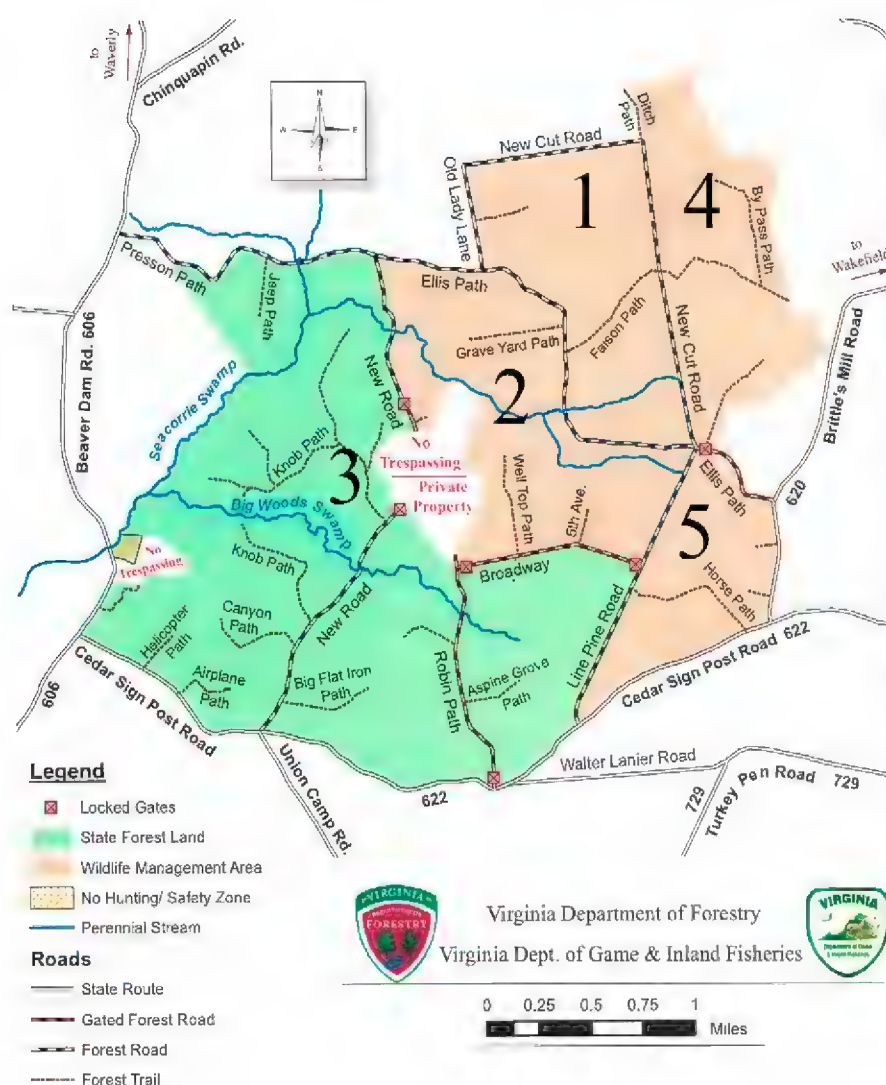


Figure 1. Big Woods State Forest and Wildlife Management Area with survey sites 1-5 (after Perry, 2018).

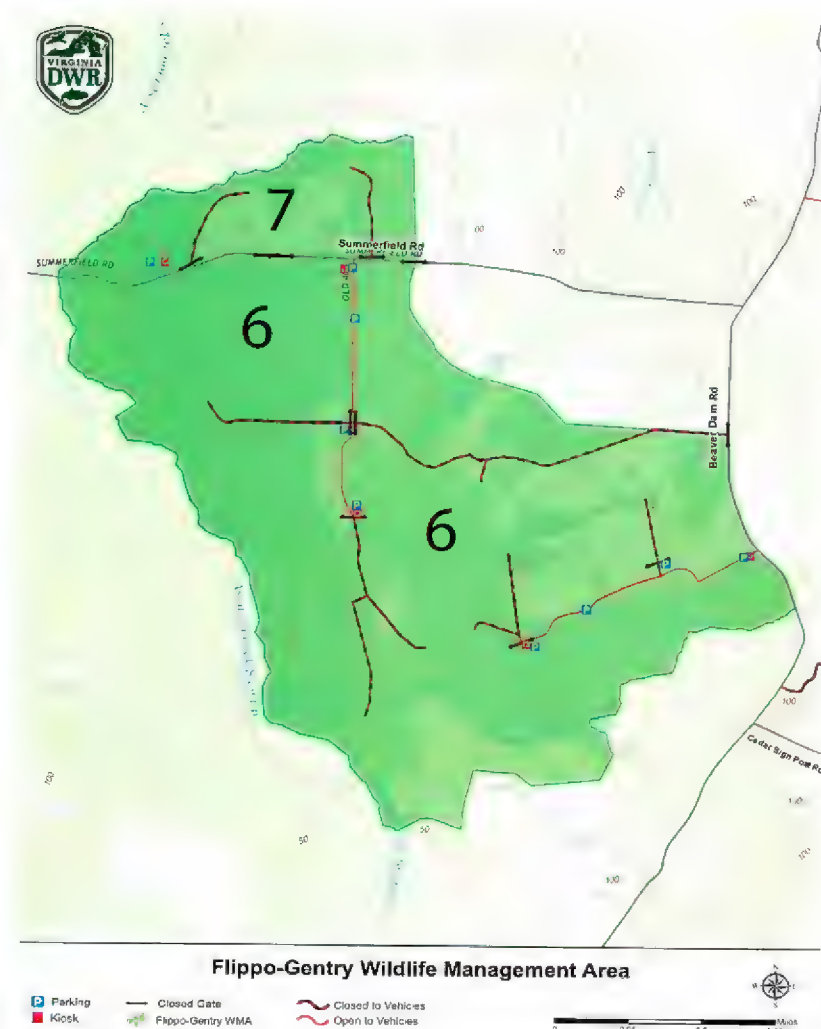


Figure 2. Big Woods Wildlife Management Area, Parker's Branch Tract (now Flippo-Gentry WMA), with survey sites 6-7.

RESULTS

In our opportunistic surveys a total of 47 species were found. This included 22 anuran species, 6 salamander, 9 snake, 7 turtle, and 3 lizard species observed and identified during the surveys in Sussex County over the last four years (Table 1). Surveys in the mid-summer and recently after rains, were intended to target many of the treefrog species not recorded during the 2017 survey (Perry, 2018) but which should be present on the property. Surveys in the early spring were intended to target many of the chorus frogs. The majority of species found (47%) were anurans, and most were located by their mating calls, either by day or at night, although all species were captured and photographed to ensure correct identification. The only anurans not found at Big Woods WMA, Big Woods State Forest, and Flippo-Gentry WMA which are documented for Sussex County in the Virginia Fish and Wildlife Information Service Database are *Anaxyrus americanus* and *Hyla versicolor*. The salamanders not found include *Ambystoma mabeei*, *Amphiuma means*, *Necturus punctatus*, *Plethodon cinereus*, *Pseudotriton ruber*, *Siren i. intermedia* and *Siren lacertina*. *Stereochilus marginatus* is not documented in the FWIS database for Sussex County but has been found in Assamoosick Swamp in the Fillipo-Gentry WMA (Ty Smith, pers. comm.). Although neither Perry (2018) nor our surveys found

Siren i. intermedia, Conley and Jurczak (2019) trapped an individual at Big Woods WMA. Because the emphasis in the present surveys has been on amphibians, there are many more reptiles documented for Sussex County not observed in the present study or Perry (2018). For snakes these include *Agkistrodon piscivorus*, *Cemophora coccinea copei*, *Francina e. erythrogramma*, *Lampropeltis elapsoides*, *L. getula*, *L. rhombomaculata*, *Thamnophis saurita*, and *T. sirtalis*. Turtles documented for Sussex County but not observed in these studies include only *Chrysemys picta marginata* (which is not native to southeastern Virginia) and *Kinosternon baurii*. The only lizard not observed in the present study and Perry (2018) is *Plestiodon fasciatus*. Combining the herps documented by Perry (2018) and the present surveys, the herps found in these properties represent 77% of the amphibians and reptiles documented for the County. This is a remarkably high percentage of the animals found in and preserved by these public lands, and even these results (Table 1) probably do not represent every species present. These surveys do not include the adjacent Piney Grove Flatwoods Natural Area Preserve where *Ambystoma mabeei* has been reported. Thus, the lands preserved in Sussex County house the vast majority of amphibians and reptiles located within the county. The trustees of these lands have done an admirable job of protecting some of the most critical areas in southeastern Virginia.

Sussex County Surveys

Table 1. Species observed in Sussex County surveys.

| Species/Survey | Perry | Sattler and Gibson |
|-----------------------------------|-------|--------------------|
| | | |
| Amphibians | | |
| Anurans | | |
| <i>Acris crepitans</i> | | X |
| <i>Acris gryllus</i> | X | X |
| <i>Anaxyrus fowlers</i> | X | X |
| <i>Anaxyrus quercicus</i> | | X |
| <i>Anaxyrus terrestris</i> | | X |
| <i>Gastrophryne carolinensis</i> | X | X |
| <i>Hyla cinerea</i> | | X |
| <i>Hyla chrysoscelis</i> | | X |
| <i>Hyla femoralis</i> | | X |
| <i>Hyla gratiosa</i> | | X |
| <i>Hyla squirella</i> | | X |
| <i>Lithobates catesbeianus</i> | | X |
| <i>Lithobates clamitans</i> | X | X |
| <i>Lithobates kauffeldi</i> | X | X |
| <i>Lithobates palustris</i> | | X |
| <i>Lithobates sphenoccephalus</i> | X | X |
| <i>Lithobates virgatipes</i> | X | X |
| <i>Pseudacris brimleyi</i> | | X |
| <i>Pseudacris crucifer</i> | X | X |
| <i>Pseudacris feriarum</i> | X | |
| <i>Pseudacris ocularis</i> | | X |
| <i>Pseudacris nigrata</i> | | X |
| <i>Scaphiopus holbrookii</i> | | X |
| | | |
| Salamanders | | |
| <i>Ambystoma maculatum</i> | X | X |

| | | |
|------------------------------------|---|---|
| <i>Ambystoma opacum</i> | X | X |
| <i>Desmognathus auriculatus</i> | X | X |
| <i>Eurycea cirrigera</i> | X | X |
| <i>Hemidactylium scutatum</i> | X | |
| <i>Notophthalmus viridescens</i> | X | X |
| <i>Plethodon chlorobryonis</i> | X | X |
| <i>Plethodon cylindraceus</i> | X | |
| <i>Pseudotriton montanus</i> | X | |
| | | |
| Reptiles | | |
| Snakes | | |
| <i>Agkistrodon contortrix</i> | | X |
| <i>Carphophis amoenus</i> | X | X |
| <i>Coluber constrictor</i> | X | X |
| <i>Diadophis punctatus</i> | | X |
| <i>Farancia a. abacura</i> | | X |
| <i>Heterodon platirhinos</i> | X | |
| <i>Nerodia erythrogaster</i> | | X |
| <i>Nerodia sipedon</i> | X | X |
| <i>Opheodrys aestivus</i> | | X |
| <i>Pantherophis alleghaniensis</i> | | X |
| <i>Storeria occipitomaculata</i> | X | |
| | | |
| Turtles | | |
| <i>Chelydra serpentina</i> | X | X |
| <i>Chrysemys picta</i> | X | X |
| <i>Clemmys guttata</i> | | X |
| <i>Kinosternon subrubrum</i> | X | X |
| <i>Pseudemys c. concinna</i> | X | |
| <i>Pseudemys c. floridana</i> | X | X |
| <i>Pseudemys rubriventris</i> | X | |
| <i>Sternotherus odoratus</i> | X | X |

Sussex County Surveys

| | | |
|--------------------------------|---|---|
| <i>Terrapene carolina</i> | X | X |
| <i>Trachemys s. scripta</i> | X | |
| | | |
| Lizards | | |
| <i>Plestiodon inexpectatus</i> | | X |
| <i>Sceloporus undulatus</i> | X | X |
| <i>Scincella lateralis</i> | X | X |
| | | |

One goal of the present surveys was to determine whether survey efforts in different times of the activity season for herps would produce additional records. Table 2 breaks down the observations of various species by the season of the observation. The activity season was divided into early spring (February and March), later spring (April and May), and summer (June and July). There were seven species (*Anaxyrus quercicus*, *Hyla gratiosa*, *Hyla squirella*, *Nerodia*

erythrogaster, *Opheodrys aestivus*, *Pantherophis alleghaniensis* and *Plestiodon inexpectatus*) which were only observed in summer months of June or July and not in April and May. *Diadophis punctatus* was only observed in the early spring months or February or March. *Clemmys guttata* was observed in the early spring and in the summer, but not in later spring. Thus, there were nine species which, even if Perry (2018) had found every herp out in April and May, they would have missed.

Table 2. Species found in early spring (February and March; Sattler and Gibson), later spring (April and May; Perry, 2018) and summer (June and July; Sattler and Gibson)

| Species/Season | Early Spring | Later Spring | Summer |
|----------------------------|--------------|--------------|--------|
| | | | |
| Amphibians | | | |
| Anurans | | | |
| <i>Acris crepitans</i> | X | X | X |
| <i>Acris gryllus</i> | X | X | X |
| <i>Anaxyrus fowleri</i> | X | X | X |
| <i>Anaxyrus quercicus</i> | | | X |
| <i>Anaxyrus terrestris</i> | X | X | X |

| | | | |
|-----------------------------------|--------|--------|--------|
| <i>Gastrophryne carolinensis</i> | | X | X |
| <i>Hyla cinerea</i> | | X | X |
| <i>Hyla chrysoscelis</i> | | X | X |
| <i>Hyla femoralis</i> | | X | X |
| <i>Hyla gratiosa</i> | | | X |
| <i>Hyla squirella</i> | | | X |
| <i>Lithobates catesbeianus</i> | X | X | X |
| <i>Lithobates clamitans</i> | X | X | X |
| <i>Lithobates kauffeldi</i> | X | X | X |
| <i>Lithobates palustris</i> | | X | X |
| <i>Lithobates sphenoccephalus</i> | X | X | X |
| <i>Lithobates virgatipes</i> | X | X | X |
| <i>Pseudacris brimleyi</i> | X | X | X |
| <i>Pseudacris crucifer</i> | X | X | X |
| <i>Pseudacris feriarum</i> | | X | |
| <i>Pseudacris nigrata</i> | X | X | X |
| <i>Pseudacris ocularis</i> | X | X | X |
| <i>Scaphiopus holbrookii</i> | | X | X |
| | | | |
| Salamanders | | | |
| <i>Ambystoma maculatum</i> | X | X | larvae |
| <i>Ambystoma opacum</i> | larvae | larvae | |
| <i>Desmognathus auriculatus</i> | X | X | X |
| <i>Eurycea cirrigera</i> | | X | |
| <i>Hemidactylium scutatum</i> | | X | |
| <i>Notophthalmus viridescens</i> | X | X | X |
| <i>Plethodon chlorobryonis</i> | X | X | X |
| <i>Plethodon cylindraceus</i> | | X | |
| <i>Pseudotriton montanus</i> | | X | |
| | | | |
| Reptiles | | | |
| Snakes | | | |

Sussex County Surveys

| | | | |
|-------------------------------------|---|---|---|
| <i>Agkistrodon contortrix</i> | | X | |
| <i>Carphophis amoenus</i> | | X | X |
| <i>Coluber constrictor</i> | | X | X |
| <i>Diadophis punctatus</i> | X | | |
| <i>Farancia abacura</i> | | X | |
| <i>Heterodon platirhinos</i> | | X | |
| <i>Nerodia erythrogaster</i> | | | X |
| <i>Nerodia sipedon</i> | X | X | X |
| <i>Opheodrys aestivus</i> | | | X |
| <i>Pantherophis alleghaniensis</i> | | | X |
| <i>Storeria occipitomaculata</i> | | X | |
| Turtles | | | |
| <i>Chelydra serpentina</i> | X | X | X |
| <i>Chrysemys picta picta</i> | X | X | X |
| <i>Clemmys guttata</i> | X | | X |
| <i>Kinosternon subrubrum</i> | X | X | X |
| <i>Pseudemys concinna concinna</i> | | X | |
| <i>Pseudemys concinna floridana</i> | | X | X |
| <i>Pseudemys rubriventris</i> | | X | |
| <i>Sternotherus odoratus</i> | | X | X |
| <i>Terrapene carolina</i> | | X | X |
| <i>Trachemys s. scripta</i> | | X | |
| Lizards | | | |
| <i>Plestiodon inexpectatus</i> | | | X |
| <i>Sceloporus undulatus</i> | | X | X |
| <i>Scincella lateralis</i> | | X | X |
| | | | |
| | | | |

Annotated Species Accounts

Amphibians

1. *Acris crepitans* (Eastern Cricket Frog): On 12 March 2021, one adult was found in a roadside ditch in the Filippo-Gentry WMA. Three were captured with dip nets in a vernal pool in site 1 on 18 June 2020 and photographed. On 15 October 2021 seven adult Eastern Cricket Frogs were found along the margin and in the woods around the beaver pond at site 7. On 3 August 2024 Eastern Cricket Frogs were calling from a pond in site 7. The Eastern Cricket Frog is probably found all throughout Big Woods WMA. They are differentiated from the Southern Cricket Frog, which also occurs on the WMA, by their more rounded or blunt snout (Figures 3 and 5), the broken/jagged dark upper stripe on their thigh, and large subanal white tubercles (Figures 4 and 6).



Figure 3. The more rounded/blunt snout on an Eastern Cricket Frog.



Figure 4. The broken thigh stripe and large white anal tubercles on an Eastern Cricket Frog.

2. *Acris gryllus* (Southern Cricket Frog): Choruses of Southern Cricket Frogs were heard throughout Big Woods WMA and State Forest. Their call has faster clicks towards the end of their call allowing them to be differentiated from the Eastern Cricket Frog, as well as the more pointed snout, solid thigh stripe and smaller anal tubercles (Figures 5 and 6). An adult Southern Cricket Frog was found in a roadside ditch at site 1 on 26 March 2021. Several adults were observed along ditches beside Co. Rt. 604 on Parker's Branch on 26 March 2021. On 9 April 2021, male Southern Cricket Frogs were heard calling from a grassy marsh in a cutover at site site 1, a depression pond at site 4. Males were heard both during the day and at night. Males were observed calling from the margins and within depression ponds at sites 1 and 4 and a private pond on the western edge of Filippo-Gentry WMA on state route 604 on 30 April 2021. Calls were heard both day and night in June 2020 throughout the WMA and they were the dominant cricket frog on the WMA. Three were captured with dip nets on 18 June 2020 in the same vernal pool in site 1 as the Eastern Cricket Frogs mentioned above. Southern Cricket Frogs were heard calling at sites 1 and 7 on 18 and 19 June 2020. During tropical storm Elsa on the night of 8 July 2021 one male was heard calling from a flooded tire rut in a cutover at site 3 and one male was heard from a shallow puddle at logging staging area at site 1. They were also heard calling in Big Woods Swamp in Big Woods State Forest, site 3, on 25 and 30 July 2024. Five metamorphs captured there and measured, had an average of 12.77 mm SVL and 0.21 g. On 22 June 2023 Southern Cricket Frogs were found at sites 1 and 4 in shallow pools. Males were heard calling and one amplexed pair was collected and placed in a ziploc bag. The next morning the female had laid 153 eggs. Of those measured,

including both males and females the average SVL 22.47 mm (SD = 1.56) and the average weight was 1.017 grams (SD = 0.27). This species is common throughout BWSF and BWWMA.



Figure 5. The more pointed snout of the Southern Cricket Frog.

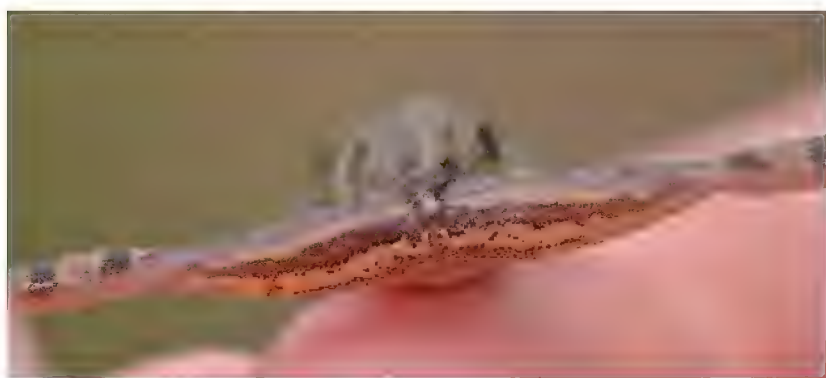


Figure 6. The solid thigh stripe and very small white anal tubercles of the Southern Cricket Frog.

3. *Anaxyrus fowleri* (Fowler's Toad): Fowler's Toads were common on the WMA. They were found frequently on the gravel roads during night surveys. Many Fowler's Toads were found AOR on 4 June 2020 throughout the WMA. Several male toads were heard calling from roadside ditches at site 1 on that same date. On 9 April 2021 three male Fowler's Toads were observed calling from a flooded logging tractor tire rut in a cutover at site 3. During tropical storm

Elsa on the night of 8 July 2021 two adult Fowler's Toads were observed AOR on Rt. 604 at site 6 and a chorus of males was heard calling from a privately owned flooded cutover adjacent to the eastern edge of the Flippo-Gentry WMA. One male was observed calling at site 2 on 22 June 2023. Two males were calling in a shallow pool in the Flippo-Gentry WMA on 25 July 2024. One or two males were heard calling from a shallow pool near a large depression pond in site 7 on 25 and 30 July and 3 August 2024. A total of ten were found while driving on roads the evening of 19 June 2020. The average SVL of 3 males was 51.70 mm and the average weight was 15.18 grams. The average SVL of 5 females was 56.91 mm and the average weight was 18.94 grams. On 30 July 2024, twenty-six metamorph toadlets were measured from site 7. The average SVL was 9.52mm and the average weight was 0.47 grams.

4. *Anaxyrus quercicus* (Oak Toad): Oak Toads were common on the WMA. In June 2020, July 2021, June 2023, and July and August 2024 choruses of males were heard throughout the WMA and State Forest. Oak Toads were heard at several locations in site 1 on the WMA in June 2020. On 4 June calling Oak Toads were heard at sites 1 and 4. Choruses were heard on both sides of New Cut Road which divides sites 1 and 4. In site 4 there was a chorus in a shallow pool close to the 90 degree bend in New Cut Road. Also in site 4 two live and one dead Oak Toad were found in deep tire tracks from previous logging work. The two live animals were found hopping on the ground, probably heading for a vernal pool where a chorus was calling the evening of 18 June 2020. The following day, in a deep tire rut forming a long pool, a dead toad was found at the bottom of the pool. The abdomen had been torn open, probably in a predation event. In site 1 there was a larger chorus also on 18

June 2020 near the intersection of New Cut Road with Old Lady Lane calling from a cutover swampy wetland with large clumps of grass. The toads called from concealed locations, and while they could be heard, they were rarely seen.

During tropical storm Elsa on 8 July 2021 this species was not out of ear shot while driving down Presson path, Ellis Path, Old Lady Lane, and New Cut Road. Very large choruses were heard in the cutover adjacent to Presson Path at site 3, a large depression pond near the intersection of Old Lady Lane and New Cut Road at site 1, and at a depression pond and flooded staging area at site 4. On this night calling, amplexus (Figure 7), and egg laying were observed.

On 8 August 2024 following Tropical Storm Debby, Oak Toads were calling throughout Big Woods WMA with a large chorus heard in site 1 west of New Cut Road and south of Faison Path, including 4 amplexed pairs of toads. This species was found in shallow depression ponds surrounded by fire controlled planted pine forests, roadside puddles, shallow depressions at logging staging areas, flooded tire ruts in cutovers with fire controlled pine forests nearby. Oak Toads seem to prefer shallow wetlands. On the night of 8 July 2021 this species was found laying eggs in the same breeding ponds as *Hyla femoralis*, *Pseudacris ocularis*, and *Pseudacris nigrita*. On 9 July 2021 a large chorus was observed at site 4 just east of Ditch Path and New Cut Road. Forty-two males and 18 females were hand captured, measured and released. Males averaged 29.71 mm SVL (Standard Deviation, SD = 1.14) and weighed 3.58 g (SD = 4.29). Females averaged 32.6 mm SVL (SD = 3.73) and weighed 3.73 g SD = 0.86). Five of these females held overnight produced clutches of 1139, 1304, 1372, 1187, and 1444 eggs. Twenty five males averaged 29.91g (SD =

2.63) and weighed 2.64 g (SD = 1.72). Seven females averaged 32.39g (SD = 1.95) and weighed 3.43g (SD = 0.74). Two of these females held overnight laid 1316 and 938 eggs.

On 22 June 2023 choruses were heard at several locations in sites 1,2 ,3. and 4 after a heavy rain following a prolonged dry spell. Pairs in amplexus (Figure 7) were seen at sites 1 and 4. Twenty five males averaged 29.91g (SD = 2.63) and weighed 2.64 g (SD = 1.72). Seven females averaged 32.39g (SD = 1.95) and weighed 3.43g (SD = 0.74). Two of these females held overnight laid 1316 and 938 eggs. They hatched within 36-48 hours and the tadpoles averaged 3.37 mm (N=30, SD = 0.32mm). Weights for the females were a mixture of gravid and spent females. Oak Toads were heard calling from sites 1 and 7 on 25 July 2024 and larger choruses on 30 July 2024 from sites 1 and 7. This animal is very common on both Big Woods WMA and Big Woods State Forest.



Figure 7. Oak Toad from Big Woods WMA.

5. *Anaxyrus terrestris* (Southern Toad): Southern Toads were found in large numbers on the WMA. A small chorus of three toads was heard in site 3, during the daytime on 18 June 2020, although the location was not readily accessible due to the thick understory

in much of the WMA. Three were found on roads in site 1 during night surveys on 19 June 2020 (Figure 8).

On the night of 9 April 2021 five adults were found on New Cut Road at site 1, six adults were found on Old Lady Road, three adults were found on Ellis Path, and one adult was found on Presson Path. Several male Southern Toads were calling that same night from a flooded logging tire rut in a cutover at site 3. Three *Anaxyrus fowleri* males were calling from the same tire rut at the same time. During tropical storm Elsa on 8 July 2021 one male was heard calling in a shallow depression pond surrounded by fire controlled pine forest at site 4 and seven males were observed in and around a shallow puddle in a logging staging area at site 1. Two adults were found AOR at site 1 and one DOR adult toad was found at site 3.

Several Southern Toads were observed in a roadside ditch and on Route 604 at the Flippo-Gentry WMA on 12 March 2021. On 26 March 2021 (air temperature 78°F) we observed large numbers of this species breeding in both the State Forest and Flippo-Gentry WMA. At 1246 hours males were calling from a shallow mud puddle and from a roadside drainage ditch at the Flippo-Gentry WMA Parking area off state route 604 at site 7. At this time amplexed pairs were observed and egg laying occurred in the roadside ditch. A fresh string of eggs was observed in the parking area mud puddle. At another parking area mud puddle at Flippo-Gentry WMA more males were calling and amplexed pairs were observed. At this site eggs were observed in both a roadside ditch and parking area mud puddle. At night on this same date many adults were found in logging vehicle flooded tire ruts and on Presson Path at site 3. At this site, males were heard calling, amplexed pairs were observed, and freshly deposited strings of eggs were found in the breeding pools. In all 24 males

and 7 females were hand captured and measured. The males averaged 54.75 mm SVL (SD = 3.99) and 17.56 g (SD = 3.55). The females averaged 56.99 mm SVL (SD = 2.87) and 24.88 g (SD = 3.70).

On 18 March 2022 a chorus was heard on Ellis Path in road ruts. Twelve males were measured then released. These averaged 51.34 mm SVL (SD = 2.94) and 15.98 g (SD = 2.94). Two gravid females in amplexus were also observed on this occasion. On 13 May 2022 fifteen toads were captured for measurements. The nine males averaged 47.89 mm SVL (SD = 3.48) and 12.49 g (SD = 2.52). Six gravid females averaged 52.97 mm SVL (SD = 3.91) and 20.89 g (SD = 4.29).

Several males were heard calling on 22 June 2023 from site 1. Seven males were found in a shallow roadside pool at site 1. They averaged 48.71 mm SVL (SD = 3.42) and 12.18 g (SD = 3.07).

Large numbers of newly metamorphosed toadlets were seen around this pond in Flippo-Gentry WMA on 9 May 2024. An adult female exhibiting axanthism on a patch of skin was observed on Knob Path at site 3 on 30 July 2024 (Figure 9).

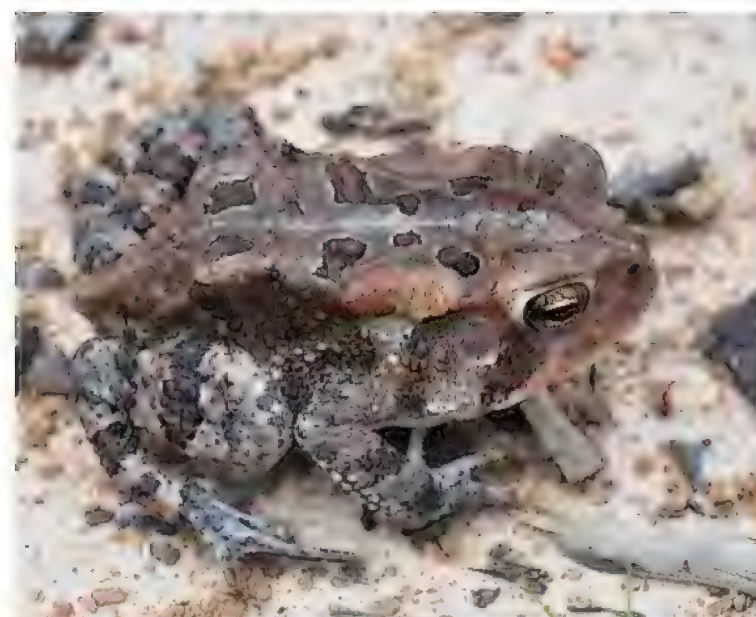


Figure 8. Southern Toad from Big Woods WMA.



Figure 9. Female Southern Toad exhibiting a patch of axanthism on the right side of body.

6. *Gastrophryne carolinensis* (Narrow-mouthed Toad): Narrow-mouthed Toads were one of the most frequently encountered anurans on the WMA. Choruses were heard throughout the WMA, calling both day and night in June 2020 following several previous days of rain. They called from concealed locations during the day and were not frequently seen. They called from somewhat less concealment during the evening hours, and at least 6 were captured in a pool in site 1 the evening of 18 June 2020, including an amplexed pair (Figure 10). They averaged 25.43 mm SVL (SD = 2.83) and 2.14 g (SD = 0.61)

Large choruses were heard on sites 4 and 6 the evening of 8 July 2021, with smaller choruses throughout the WMA. During tropical storm Elsa on 8 July 2021 we heard large choruses of this species at sites 3, 4, and 6. Additionally on that night we hand captured 21 males and 8 females, some were found in amplexus. The males averaged 28.05 mm SVL (SD = 1.58) and 2.61 g (SD = 0.72). The eight females averaged 29.72 mm SVL (SD = 3.53) and 3.53 g (SD = 0.41). Calling males and amplexed pairs were found in flooded logging staging areas, road rut puddles, flooded logging tire ruts in cutover, and several shallow depression ponds adjacent to pine forests. On 9 July many

floating egg masses were observed in the flooded logging staging areas and road rut puddles.

Many choruses of Narrow-mouthed Toads were observed during the day and night on 22 June 2023 in shallow pools at sites 1, 2, and 4. Many amplexed pairs were observed during the night and floating egg masses were observed the next morning. Two pairs of frogs were placed in ziploc bags with water and the next morning were found to have laid 1201 and 682 eggs each. Measurements were made on five gravid females. They averaged 28.35 mm SVL (SD = 4.04) and 3.13 g (SD = 0.62).

On 25 July 2024 numerous choruses of Narrow-mouthed Toads were heard at sites 1, 4, and 7. Likewise, on 30 July 2024 numerous choruses were heard at sites 1, 4, and 7. This is a very common species throughout BWSF and BWWMA.



Figure 10. Amplexus in Narrow-mouthed Toads.

7. *Hyla chrysoscelis* (Cope's Gray Treefrog): On 4 June 2020 male Cope's Gray Treefrogs were heard calling near a stream at site 3. Cope's Gray Treefrogs were not seen, but individual males could be heard calling the

evenings of 18 and 19 June 2020. A large chorus was heard off Old Lady Lane in site 1 on 19 June 2020.

On 9 April 2021 a juvenile Cope's Gray Treefrog was found on state route 604 in the Flippo-Gentry WMA. One male was heard calling the night of 30 April 2021 at site 2. Several males were found on the road at sites 1 and 7 the evening of 8 July 2021. On 13 May 2022 twenty calling males were captured for measurements on Route 604 on the Flippo-Gentry WMA. They averaged 42.24 mm SVL (SD = 2.42) and 6.95 g (SD = 1.04). Male Cope's Gray Treefrogs were heard calling at sites 1, 2, and 7 on the night of 22 June 2023 and in roadside ditches along Ellis Path in site 2 on 9 May 2024. A chorus was calling from roadside ditches along Rt. 604 in Flippo-Gentry WMA site 7 the evening of 25 July 2024. On 30 July 2024 after a heavy thunderstorm Cope's Gray Treefrogs were heard throughout Big Woods and Flippo-Gentry WMAs at sites 1, 4, and 7. Amplexed pairs were observed in a depression pond at site 7 at this time.

8. *Hyla cinerea* (Green Treefrog): A large chorus of Green Treefrogs was heard at one location in site 2 the evenings of 18 June 2020 and 8 July 2021 from Seacorrie Swamp about 100 m east of Ellis Path. Thick underbrush discouraged a visit to the exact location at that time. A visit to this site at dusk on the evening of 9 May 2024 found about a dozen males calling, along with 3-4 Cope's Gray Treefrogs and hundreds if not thousands of Little Grass Frogs. A large chorus was heard at the same site on 25 July 2024. On 30 July 2024 we collected, measured and released 15 males from this site. The males averaged 45.76 mm SVL and 4.94 g. Several Green Treefrogs were heard at Big Woods Swamp site 3 in Big Woods State Forest towards dusk on 30 July 2024.

Green Treefrogs are restricted to the largest swamps at Big Woods WMA and State Forest.

9. *Hyla femoralis* (Pine Woods Treefrog): The Pine Woods Treefrog was another species which was very common on the WMA. Small and larger choruses were heard throughout the WMA almost everywhere. The pine woods habitat seems to be ideal for this species. They were breeding in the small pools produced by low spots in the topography, and wheel ruts produced by logging equipment in small areas which had been timbered, as well as roadside ditches.

Males were heard calling at sites 1 and 3 on 4 June 2020. Seven animals were captured and photographed the evening of 18 June 2020 in site 1. An amplexed pair was left undisturbed but photographed (Figure 11). A large Plain-bellied Watersnake was captured in a small pool in site 1 on 18 June 2020 and taken to the road for photos before being released. It regurgitated a Pine Woods Treefrog which appeared to be dead. It was placed in a plastic bag and kept in a cooler for more than 24 hours then frozen for dissection of the stomach to determine its diet. While thawing, it was noticed the fingers started to move, so the animal was not dissected, but thawed completely, seemed healthy, and was released alive. Mitchell (1994) states that little is known of the diet of *Nerodia erythrogaster*, although Wright and Wright (1957) include frogs in their diet. This example reinforces the fact that frogs can be a major part of the diet. On 18 June 2020 eleven Pine Woods Treefrogs were captured for measurements. The nine males averaged 27.76 mm SVL (SD = 1.97) and 1.82 g (SD = 0.27). The two gravid females were 32.13 and 35.38 mm SVL and 3.26 and 3.16 g.

On 9 April 2021 18 metamorph or very small juvenile Pine Woods Treefrogs were

collected along the grassy edge of a ditch at site 1. They averaged 14.18 mm SVL (SD = 1.38) and 0.21 g (SD = 0.04). An additional adult and metamorph were found in a pine forest adjacent to a depression pond at site 4. A Pine Woods Treefrog measuring 14.87 mm was found in a grassy margin beside a roadside ditch at site 1 on 30 April 2021. This may represent a recently metamorphosed individual or a juvenile animal.

During tropical storm Elsa on the night of 8 July 2021 this species was heard and hand captured in large numbers at sites 1, 4, and 6. Males were heard calling from shallow depression ponds, flooded tire ruts, shallow puddles at logging staging areas. In several areas males were not only calling from the ground but were also calling from grassy vegetation 3-4 m high. At sites 4 and 6 the calling was so loud that one author put in ear plugs. Many amplexed pairs were observed at these sites and on 9 July we found many clutches of eggs at these sites. Numerous animals were hand captured and measured. Forty-five males averaged 31.19 mm SVL (SD = 2.63) and 2.05 g (SD = 0.83). Nine females averaged 31.44 mm SVL (SD = 3.03) and 3.11 g (SD = 0.72).

On the night of 22 June 2023 numerous males were observed calling from shallow pools at sites 1, 2, and 4. Many amplexed pairs were observed in breeding pools and the next morning numerous floating egg masses were observed on the surface of the pools. Twenty-three males averaged 31.64 mm SVL (SD = 1.99) and 2.04 g (SD = 0.37). Six gravid females averaged 31.69 mm SVL (SD = 0.95) and 3.32 g (SD = 0.80).

Very large choruses were heard throughout Big Woods WMA from both forested areas and flooded roadside ditches on 25 July 2024, and two gravid females were captured, one in

a ditch and one on New Cut Road beside the ditch. These choruses included two very large choruses from Big Woods State Forest along Preston Path in site 3 in an area which had been recently clearcut, which created many tire rut depressions from the logging equipment.



Figure 11. Amplexed pair of Pine Woods Treefrogs.

10. *Hyla gratiosa* (Barking Treefrog): Several large choruses of Barking Treefrogs were heard on 4 June 2020. A chorus of Barking Treefrogs was found the evening of 18 June 2020. While this is not a new record for the county, it is a new location (J.D. Kleopfer, pers. comm.). Four males and one female in amplexus were measured, photographed (Figure 12), and released. We predicted to hear and find large numbers of this species when we surveyed the area during tropical storm Elsa on the night of 8 July 2021. To our surprise we did not hear a single male Barking Treefrog calling. We did find two males sitting on floating logs in a shallow flooded area. After a prolonged rain during the week we found one calling male and two other males in a shallow pool at site 1 on the night of 22 June 2023. A large chorus of more than 50 Barking Treefrogs was heard the evening of 25 July 2024 in a large pond formed the previous year during a thinning of trees to produce a more open pine

savannah on the Flippo-Gentry WMA . The evening of 30 July 2024 the same chorus was again active at the same site. Fifteen males were captured, measured and released. These males averaged 63.15 mm SVL and 18.94 g. Three females in amplexus were found with these males and another female on Rt. 604 heading towards the chorus. The average of all males was 58.04 mm SVL (SD = 3.56) and 17.42 g (SD = 3.56). The average for the two females which could be determined to be gravid 63.89 mm SVL (SD=24.84) and 21.05 g (SD = 4.05).



Figure 12. Amplexed pair of Barking Treefrogs.

11. *Hyla squirella* (Squirrel Treefrog): During tropical storm Elsa on the night of 8 July 2021 one male of this species was heard calling from a road-side puddle adjacent to a pine forest at site 3 and several males were heard calling from a shallow depression pond at site 6. Two were hand captured and photographed at site 6. Large choruses were heard the same evening from a privately owned flooded cutover off St. Rd. 604 at the eastern edge of the Flippo-Gentry WMA.

Fourteen Squirrel Treefrogs were found in a shallow breeding pool at site 1 or on the road beside the pool on 22 June 2023. They averaged 27.96 mm SVL (SD =2.54) and 1.56 g (SD = 0.26). As it got dark that night

the males started calling from the woods on the opposite side of the road from the pool. Males then began moving to the pond shortly after dark. Males were observed calling from shrubs in the woods and along the margin of the roadside breeding pools. Numerous males were also heard calling from shallow pools at site 7 on that same night.

On 30 July, 3 August and 8 August 2024 a large chorus of Squirrel Treefrogs was heard in the newly created shallow wetland in site 7 on the Flippo-Gentry WMA. This seems to be the largest population in the area with 20-30 males calling on these evenings. An amplexed pair was observed on 30 July. This species is more numerous on the Flippo-Gentry WMA than on the Big Woods WMA.

12. *Lithobates catesbeianus* (American Bullfrog): A bullfrog was heard calling at the intersection of county route 620 and county route 622 on 4 June 2020. One large (230 g.) female American Bullfrog was captured by hand in a large but shallow pool in site 1 the evening of 18 June 2020. Another bullfrog was heard calling from a beaver swamp on site 7 on 19 June 2020.

Two large adult frogs were observed in a vernal pool beside Ellis Path at site 1 on 12 March 2021. Two adult males were hand captured the evening of 26 March 2021 from ditches along New Cut Road (122.06 and 139.83 mm SVL and 220 and 300 g). On 9 April 2021 one male was heard calling from inside a depression pond at site 4. While road cruising at night on this same day, six large adults were found on New Cut Road, Presson Path, and state route 604. Two of these females were 132.43 and 109.02 mm SVL and 190 and 110 g. A male bullfrog was heard calling from a private pond at the western edge of Flippo-Gentry WMA on 30 April 2021. One female was captured in a flooded logging staging area at site 1 on the evening of 8 July 2021. At least one male

was heard calling from a large permanent depression pond in site 7 on the evenings of 25 and 30 July 2024. Bullfrogs are probably not common on the WMA. They may be more commonly found in the larger swamps on the property, since large permanent bodies of water are the preferred habitat (Martof et al., 1980). Many large bullfrogs can be found on the WMA roads on wet nights. Just as we collect frogs on the roads they collect smaller frogs for food.

13. *Lithobates clamitans* (Green Frog): An adult Green Frog was found in a depression pond at site 1 on 4 June 2020. Green Frogs were heard calling at sites 1 and 3 on 18 June 2020 and site 7 on 19 June 2020. A juvenile Green Frog was found sitting in a roadside ditch beside Route 604 at Parker's Branch on 12 March 2021. One adult Green Frog was found on Presson Path on the night of 9 April 2021. On 30 April 2021 Green Frog tadpoles were dipnetted in a depression pond and a flooded logging staging area as site 4. Many of the tadpoles had well developed hind limbs.

Green Frogs were heard calling in Big Woods Swamp at the end of Knob Path in site 3 on 25 and 30 July 2024. Green Frogs were calling in Seacorrie Swamp in site 4 the evening of 30 July 2024 and an adult male observed sitting on a large tree stump in the swamp. One adult Green Frog was found on the bridge crossing Assamoosick Swamp at site 7.

14. *Lithobates kauffeldi* (Mid-Atlantic Coast Leopard Frog): An adult male Mid-Atlantic Coast Leopard Frog was captured while it was crossing Co. Rt. 604 on the Flippo-Gentry WMA at the bridge over Assamoosick Swamp in site 7 the evening of 12 March 2021 (Figure 13). A large chorus was heard and recorded calling from the north side of the road in a Cypress swamp. A possible intergrade was captured and

photographed the same evening from a pond in site 6. At Big Woods WMA, *Lithobates kauffeldi* appeared to be calling from large Cypress swamps while *Lithobates sphenoccephalus* seemed to be calling from smaller, more ephemeral pools.



Figure 13. *Lithobates kauffeldi* from Rt. 604 at Assamoosick Swamp.

15. *Lithobates palustris* (Pickerel Frog): One male pickerel frog was heard calling from the edge of a large privately owned pond at the western edge of the Flippo-Gentry WMA on the night of 30 April 2021. On 4 June 2020 an adult Pickerel Frog was found by a stream at site 3.

16. *Lithobates sphenoccephalus* (Coastal Plains Leopard Frog): Several Coastal Plains Leopard Frogs were heard calling in a small roadside ditch along New Cut Road at site 1 on 18 June 2020. During the day of 27 February 2021, two large choruses of leopard frogs were heard in a grassy swampy cutover at site 1. Fresh egg masses of this species were found at various locations on 6 March 2021 and 2 February 2024. Large choruses were heard 12 and 26 March 2021 in a large depression pond, in a swampy cutover, and along roadside ditches at site 1 and from flooded logging tire ruts in a cutover at site 3. The chorus observed at the large depression pond near the intersection of Old Lady Lane

and New Cut Road at site 1 must have been composed of hundreds of males. It is the largest chorus we have ever heard in Virginia. Eggs were observed on 12 March 2021 and 26 March 2021 and tadpoles on 26 March 2021. On 12 March hatching was observed on one egg mass. On 9 April 2021 one adult was caught at the edge of a depression pond and one male was heard calling at 1900 hours at site 4. That same night 11 adults were found on the road or at the edge of roadside ditches at site 1. Additionally, one dead adult found on 9 April 2021 was dissected and found to be parasitized by a nematode worm. On 30 April 2021, numerous adults were found in and along the margin of depression ponds and a roadside ditch at site 1. At a depression pond and a flooded logging staging area at site 4 many well developed tadpoles close to metamorphosis were dipnetted on this same date. On the night of 22 June 2023 several male frogs were heard calling from shallow pools at site 1. On 15 October 2021 two egg masses were found in a shallow pool at site 1. The Gosner stage 19 larvae had hatched and were attached to the egg jelly. This observation shows that the breeding of this species has both spring and fall reproduction. On that same date an adult leopard frog was hand captured in an outflow stream coming out of a beaver pond at site 7 and a leg of a predated leopard frog was found in a tree next to the beaver pond at site 7. On 27 January 2024 a small chorus of southern leopard frogs was heard in a small depression pond in site 1. There were three egg masses present, one of which had just been laid and the jelly had not yet expanded with the uptake of water. At this same site on 25 July 2024 several adults were heard calling.

17. *Lithobates virgatipes* (Carpenter Frog): Two small adult Carpenter Frogs were observed on 26 March 2021. One from site 1 was in a large swampy area characterized as

an open cut over area with numerous small pools. This animal was captured, measured (99.72 mm SVL and 45.64g), photographed (Figure 14) and released. Another small adult was observed, but not captured, in a large depression pond at site 4. Two Carpenter Frogs were heard calling in Big Woods Swamp in site 3 on 25 July 2024, and several also calling there towards dusk on 30 July 2024.



Figure 14. *Lithobates virgatipes* from site 1 at Big Woods WMA.

18. *Pseudacris brimleyi* (Brimley's Chorus Frog): On 27 February 2021, several male Brimley's Chorus Frogs were heard calling from a depression pond at site 6. Six males were heard calling on 6 March 2021 from a grassy swampy cutover at site 1. Brimley's Chorus Frogs were heard from a swampy area in site 1 on 12 and 26 March 2021. On different days, from 2 to 12 males were heard calling from concealed large clumps of grasses. Recordings of the calls were made, but animals were never able to be captured until March 2024. Identification was initially made from the calls, which have a significantly faster call rate than *Pseudacris nigrata* or *Pseudacris feriarum*. On 9 April 2021 five male Brimley's Chorus Frogs were heard calling during the day in a grassy marsh in a cutover at site 1. Calling frogs were also heard at this site during the night. On 27

March 2024 a male Brimley's Chorus Frog was captured by placing multiple crayfish traps around the grassy clump from which the male was calling, and leaving them overnight. It weighed 2.051 g and had a SVL of 30.04 mm. On 30 March 2024 the same technique was used to yield a gravid female (Figure 15). The female weighed 2.214 g before dumping 184 eggs when she then weighed 1.587 g, and had a SVL of 27.54 mm.



Figure 15. *Pseudacris brimleyi* female from site 1.

18. *Pseudacris crucifer* (Spring Peeper): Many metamorphs were found along a depression pond at site 1 on 4 June 2020. Many Spring Peeper metamorphs were found along the margins of depression ponds at site 1 on 18 June 2020. On 27 February 2021, a spring peeper was heard calling from site 7. Spring Peepers were heard calling from a large swampy area covered with clumps of tall grass, containing small open pools of water, in site 1 during visits in March. On 9 April 2021 several metamorphs were found along a grassy edge along a ditch at site 1. Males were heard calling that night from a depression pond at site 4 and a grassy marsh in a cutover at site 1. Several Spring Peeper males were heard calling on 15 October 2021 at sites 1 and 7.

20. *Pseudacris nigrita* (Southern Chorus Frog): Large Choruses of Southern Chorus

Frogs were heard from various locations in the Big Woods WMA, Big Woods State Forest, and Flippo-Gentry WMA (sites 1, 3, 4, 6 and 7). A few males were heard calling from a roadside pool at site 7 on 27 February 2021. Several males were captured, measured, photographed (Figure 16) and released on both 12 and 26 March 2021, and 18 March 2022. Seventeen males from 18 March averaged 23.33 mm SVL (SD = 1.78) and 23.33 g (SD = 1.78). Three gravid females from the same night averaged 26.84 mm SVL (SD = 1.73) and 1.42 g (SD = 0.15). An amplexed pair was captured from site 6 on 12 March 2021 (Figure 17) and while held overnight for measurements and photographs the next day, laid 108 eggs. Amplexis was also observed on 18 March 2022 with two females laying 160 and 172 eggs respectively that evening. Eggs and adults were released in the ponds of capture the following day. Eggs were observed both on 12 and 26 March 2021 in roadside ditches along Co. Rt. 604 on the Flippo-Gentry WMA. On 9 April 2021 Southern Chorus Frogs were heard calling from a grassy marsh in a cutover at 1509 hours at site 1. That night males were heard calling from a depression pond at site 4 and the grassy marsh at site 1. A gravid female was measured at 33.06 mm SVL and 2.17 g. Two adults were also found sitting on the road adjacent to the grassy marsh at site 1. On the night of 22 June 2023 we heard many male Southern Chorus Frogs calling from roadside ditches at sites 1 and 4. During tropical storm Elsa on the night of 8 July 2021 we hand captured 3 Southern Chorus Frogs (2 males and 1 female) and heard other males in a roadside puddle at site 4. They were placed in a one gallon half filled plastic bag of water and the female laid 210 eggs on 10 July 2021. One clutch of eggs were observed attached to the stem of a plant in a flooded logging staging area at site 1 on 8 July 2021. A few males were calling on 27 January 2024 and one was captured after

jumping into a small ditch along New Cut Road in site 1. On 2 February 2024 two choruses were heard in site 1 at Big Woods WMA. One had at least a dozen males calling from a marsh and there were hundreds calling from the large pond west of New Cut Road. The Southern Chorus Frog was the most common *Pseudacris* on the WMA and other than the two *Pseudacris brimleyi* mentioned above, the only chorus frogs we observed from those obtained “in hand”.



Figure 16. *Pseudacris nigrita* male.



Figure 17. *Pseudacris nigrita* amplexed pair.

21. *Pseudacris ocularis* (Little Grass Frogs): One of the highlights of the June 2020 survey was finding Little Grass Frogs. There were two choruses in site 1 where they were heard. Their small size made them hard to locate. However, two were captured, measured, photographed (Figure 18) and released. On 9 April 2021 three male Little Grass Frogs

were observed calling at 1500 hours from a planted pine forest and one from the grassy area next to a roadside ditch at site 1. Another single male was heard calling from the margin of a depression pond at site 4. Thirty Little Grass Frogs were captured, measured and released on 9 April 2021, and 27 on 30 April 2021 at a roadside ditch at site 1. The thirty from 9 April averaged 13.86 mm SVL (SD = 2.72) and 0.20 g (SD = 0.11). The frogs captured on 30 April 2021 were predominately found by walking along the edge of the roadside ditch and finding them in short grass. They were detected when they moved. Little Grass Frogs were heard calling on 30 April 2021 and 18 March 2022 at site 1. On a night visit on 4 June 2020 Little Grass Frogs were calling from roadside ditches bordering New Cut Road at site 1. During the day and night of 22 June 2023 were heard numerous calling males all over sites 1, 2, 3, and 4. Choruses were loud with many overlapping males. About an hour after dark we began to find amplexed pairs of frogs. Four pairs of amplexed frogs were placed in ziploc bags with water and grass and the next morning four clutches of eggs were found. The clutch sizes were 216, 178, 256, and 268. We have never heard that many Little Grass Frogs calling on any night anywhere in Virginia. During tropical storm Elsa on 8 July 2021 this species was not out of ear shot while driving down Presson path, Ellis Path, Old Lady Lane, and New Cut Road. We did not hear large choruses of this species at any given place but while driving males could be heard in almost every shallow wet depression. Breeding habitats include shallow depression ponds surrounded by fire controlled pine forest, flood tire ruts in cutover, shallow swampy wetlands, flooded depressions in logging staging areas, roadside ditches and the large swamp in site 4. The largest aggregation of Little Grass Frogs was observed on 9 May 2024. Walking through thick brush from Ellis Path to

Seacorrie Swamp in site 4 there were dozens on the brush and hundreds if not thousands in the swamp itself, on emergent vegetation and in the water itself. This must be the largest population of Little Grass Frogs in Virginia. On 25 July 2024 there were more than 100 Little Grass Frogs calling after dark from a large depression pond near the intersection of Old Lady Lane and New Cut Road in site 1 of Big Woods WMA. There were a few calling on 30 July 2024 from a large depression pond beside Rt. 604 in the Flippo-Gentry WMA following a very heavy rain. This species is common at the northern portion of site 1 at Big Woods State Forest, and sites 1, 2, 4 at Big Woods WMA.



Figure 18. Little Grass Frog from Big Woods WMA site 1.

22. *Scaphiopus holbrookii* (Eastern Spadefoot): Two adult Eastern Spadefoots (a male and a female) were found separately the evening of 9 April 2021 on St. Rt. 604 (the boundary between sites 6 and 7 in the Flippo-Gentry WMA). The female was 55.49 mm SVL and 23.75g. The male was 50.29 mm SVL and 13.68g. Four spadefoot males were measured on 30 July 2024 and averaged 57.19 mm SVL and 19.73 g. Two were captured in a depression pond in Flippo-Gentry WMA where they were sitting in shallow water but not yet calling. One was captured in a nearby depression pond where it was calling after a very heavy rain, along

with several other males which were not captured. The fourth was found on Rt. 604 heading towards the pond containing the calling males. On 3 August 2024 a juvenile spadefoot was observed on Rt. 604 in the Flippo-Gentry WMA near the area where the previous four were found.

23. *Ambystoma maculatum* (Spotted Salamander): On 22 January 2021 a large adult Spotted Salamander was dipnetted in a vernal pool at site 7. A freshly laid egg mass was also found on this date at the same site. Thirty-three egg masses were found in an assortment of vernal pools at site 7 on 27 February 2021. Freshly deposited egg masses, not seen the week before, were found at site 7 on 6 March 2021. An adult male and numerous egg masses were observed in the same pool on 12 March 2021. Six Spotted Salamander larvae were dip-netted from a small pool in site 7 in June 2020. It was the same pool in which the Snapping Turtle and Mud Turtles were observed. The larvae, along with various tadpoles most likely served as prey for the turtles. There was considerable vegetation in this pool, unlike many others in the WMA and would have given the amphibian larvae some cover from the turtles. Numerous larvae of this species were dipnetted in a vernal pool at site 7 on 19 June 2020.

24. *Ambystoma opacum* (Marbled Salamander): Numerous larvae of the Marbled Salamander were found in pools in sites 4, 6 and 7 in March of 2021. On 9 April 2021 several larvae were dipnetted in small puddles in a pine forest at site 4. Several large Marbled Salamander larvae near metamorphosis were dipnetted in a depression pond beside Old Lady Lane at site 1 on 30 April 2021. We never observed adults, but we did not make surveys in the fall when adults would be more easily observed.

25. *Eurycea cirrigera* (Southern Two-lined Salamander): On 9 April 2021 one adult was found along a large stream at site 3. A larval Two-lined Salamander was captured in a tributary to Seacorrie Swamp in site 2 on 13 March 2021. Two-lined Salamanders were observed under rocks by a stream at site 3 on 4 June 2020. Larvae were particularly obvious in Seacorrie Swamp at night when they were out from under cover, presumably foraging.

26. *Desmognathus auriculatus* (Southern Dusky Salamander): A number of Southern Dusky Salamanders were found in the evening 4 June 2020 along a tributary to Seacorrie Swamp off Presson Path in site 3. On 18 June 2020 a gravid female was captured, measured (54.44 mm SVL and 2.64 g), photographed and released. It was missing most of its tail. A juvenile Southern Dusky Salamander was found under a rock at site 3 on 15 October 2021. While Pyron and Beamer (2023) have redescribed *Desmognathus auriculatus* in Virginia as a new species (*Desmognathus lycos*) the Society for the Study of Amphibians and Reptiles and the VHS still recognize *D. auriculatus*. However, the current (8th edition) of the SSAR Scientific and Standard English Names of Amphibians and Reptiles (Crother 2017) was published prior to the publication of Pyron and Beamer (2023).

27. *Notophthalmus v. viridescens* (Red-spotted Newt): Two larvae were dip-netted from a shallow depression pond in site 4 on 30 April 2021. An adult male was dipnetted from site 7 in Assamoosick Swamp on 22 June 2023 and an adult female on 26 June 2023. An adult male and an adult female were dipnetted from a vernal pool in the Flippo-Gentry WMA on 2 February 2024 and an adult female was dipnetted from the same vernal pool on 13 March 2024.

28. *Plethodon chlorobryonis* (Atlantic Coast Slimy Salamander): Three adult and one juvenile Atlantic Coast Slimy Salamanders were found under logs in a pine forest at site 7, in the forest surrounding a stream going into Assamoosick Swamp on 19 June 2020. On the evening of 9 April 2021 one adult slimy salamander was found sitting on Presson Path Road (58.05 mm SVL, 103.6 mm TL and 3.18g). Two adults and a juvenile were captured, measured, photographed and released on 29 May 2021. The adults were 65.74 and 56.90 mm SVL, 131.93 and 102.11 mm TL. Five (one adult male, one adult female and three juveniles) were observed on 2 February 2024 in the floodplain of the stream crossing Ellis Path.

Reptiles

29. *Agkistrodon contortrix* (Eastern Copperhead): One adult Eastern Copperhead was found on state route 604 not far from the Flippo-Gentry WMA on the evening of 9 April 2021.

30. *Carphophis amoenus* (Eastern Wormsnake): One adult Eastern Wormsnake was found under a log in a forested section of site 7 on 26 June 2023. A juvenile Wormsnake was found swimming in a depression pond in Flippo-Gentry WMA on 30 July 2024 after being displaced by a very heavy rain.

31. *Coluber constrictor* (Black Racer) - one adult was observed crossing State Route 604 near Parkers Branch Tract on 9 July 2021. A second adult was observed near a small pond in site 7 in April 2021. An adult was observed crossing New Cut Road on 23 June 2023.

32. *Diadophis p. punctatus* (Southern Ring-necked Snake): One adult with a broken neck

band and half moons on its venter was found on New Cut Road the night of 9 April 2021.

33. *Farancia a. abacura* (Eastern Mudsnsake): A large adult (approx. 1.3 m) Mudsnsake was observed on 18 March 2022 in a large pond on site 1. It was moving slowly underwater, probably foraging. The snake was moved to New Cut Road and photographed (Figure 19) then returned and released in the same location in the same pond.



Figure 19. *Farancia a. abacura* from site 1.

34. *Nerodia erythrogaster* (Plain-bellied Watersnake): One large adult Plain-bellied Watersnake was found in a small pool in site 1 where it was presumably hunting small frogs on the evening of 18 June 2020. This is the animal which regurgitated a Pine Woods Treefrog (Figure 20). Mitchell (1994) describes the typical habitat as swampy wetlands. Mitchell (1994) states that Plain-bellied Watersnakes are typically diurnal, but can move overland at night especially during and after warm rains. They must also forage at night since the Pine Woods Treefrog regurgitated by this specimen must have been recently consumed as it was still alive when regurgitated somewhere around 2200 hr.



Figure 20. *Nerodia erythrogaster* regurgitating a *Hyla femoralis*.

35. *Nerodia s. sipedon* (Northern Watersnake): A fresh road killed Northern Watersnake was found on State Route 604 near the Flippo-Gentry WMA on 9 April 2021. A Northern Watersnake was found by a stream at site 3 on 4 June 2020. A yearling Watersnake was observed in a pond in site 1 on 18 March 2022.

36. *Opheodrys aestivus* (Rough Greensnake): A juvenile Rough Greensnake was captured, photographed and released at a roadside ditch in site 1 on 26 June 2023. The snake was moving along the bank of the ditch then moved into the water in the ditch and was captured as it swam.

37. *Pantherophis alleghaniensis* (Eastern Ratsnake): A juvenile Eastern Ratsnake was found on St. Rt. 604 on Parkers Branch on 22 June 2021.

38. *Chrysemys p. picta* (Eastern Painted Turtle): One DOR Eastern Painted Turtle was observed at the end of State Route 604 at the western side of Parker's Branch Tract on 30 April 2021. An adult female Painted Turtle was observed digging a nest on 29 May 2021 on a dirt road on site 7. She had apparently come up from Assamoosick Swamp, which was only about 50 meters from the road. It was raining and the ground was wet. Three males were captured in a

crayfish trap the evening of 18 March 2022 on site 2. A single adult was observed basking on a log in Assamoosick Swamp on 22 June 2023. A juvenile was dipnetted in a large pond in site 7 on the Flippo-Gentry WMA on 3 August 2024.

39. *Clemmys guttata* (Spotted Turtle): A small (CL=82.5mm) Spotted Turtle was found in a depression pond adjacent to a pine forest on 12 March 2021. It was measured and photographed (Figure 21) then released at the same site. An adult male was observed in a pond on 18 March 2022. Precise locations are withheld. An adult turtle was observed basking on a log in a swamp on 22 June 2023. An adult male was found in a depression pond on 27 January 2024. A leech was attached to the shell but not the body of the turtle. As the turtle was handled the leech began to move. When the turtle was returned to water the leech left the turtle. A juvenile was found in the same depression pond on 2 February 2024.



Figure 21. *Clemmys guttata* from

40. *Chelydra serpentina* (Snapping Turtle): On 18 March 2022, a small adult snapping turtle was observed in a small but deep vernal pool just off the path in site 7 going to Assamoosick Swamp. The turtle was moving slowly underwater, apparently foraging. There were numerous tadpoles in the pool, which was probably the intended prey. Another juvenile was found in site 4 on 22

June 2023 in a small pool, and another in the same pool on 25 July 2024.

41. *Kinosternon subrubrum* (Mud Turtle): An adult Mud Turtle was observed in a water-filled ditch along Co. Rt. 604 in Parker's Branch the afternoon of 26 March 2021. A pair of Mud Turtles were captured in a crayfish trap baited with sardines and set in a small depression pond at site 7 in the Parker's Branch Tract of the WMA on 18 June 2020. This is the same pool where a Snapping Turtle was observed. One adult turtle was observed in a flooded tire rut in a cutover at site 3 on 8 July 2021. An adult was observed in a large pond in site 7 on 3 August 2024.

42. *Pseudemys concinna floridana* (Coastal Plain Cooter): One large adult female Coastal Plain Cooter was observed on New Road where it crosses Big Woods Swamp on the afternoon of 18 June 2020. It was apparently a female looking for a nesting site as eggs could be palpated. The turtle was photographed and released at the site. An adult was observed basking on a log in the Assamoosick Swamp on 22 June 2023.

43. *Sternotherus odoratus* (Eastern Musk Turtle): A shell (bones only) of an adult Eastern Musk Turtle was found beside the trail going to Assamoosick Swamp in site 7 on 19 June 2020. This was near the pool where the Snapping Turtle and Mud Turtles were observed. On 25 July 2024 a juvenile was dipnetted from Assamoosick Swamp at the bridge on Co. Rt. 604.

44. *Terrapene carolina* (Woodland Box Turtle): A live adult Box Turtle was found on the forest floor in site 7 near Assamoosick Swamp on 19 June 2020. The female turtle had the following measurements: carapace length = 131.43 mm, plastron length = 114.26 mm, and widest width of carapace = 104.66 mm. An adult Woodland Box Turtle was

observed on the side of State Route 604 between sites 6 and 7 on 23 June 2023. Another adult was observed in one of the trails in site 7 on 26 June 2023. On 8 July 2021 an adult Woodland Box Turtle was found AOR on state route 604 near the Parker's Branch main parking area. It was observed eating carrion that we assume was scavenged off the road.

45. *Plestiodon inexpectatus* (Southeastern Five-lined Skink): One juvenile Southeastern Five-lined skink was found under a rotten pine log on site 4 on 22 June 2021.

46. *Sceloporus undulatus* (Eastern Fence Lizard): One male Eastern Fence Lizard was found at the edge of a pine forest on 9 July 2021.

47. *Scincella lateralis* (Little Brown Skink): On 4 June 2020 at 2205 hours two adults were found crawling in short grass by a roadside ditch at site 1. One adult was found crossing New Cut Road heading from site 1 to site 4 on 22 June 2023. This observation was made during a heavy rainstorm.

DISCUSSION

Additional surveys of Big Woods State Forest, Big Woods Wildlife Management Area, and Flippo-Gentry Wildlife Management Area were conducted for several reasons. First, there were species reported from the Perry survey which were not vouchered (*Acris crepitans*), and therefore not included in the report, and we wanted to confirm their presence. Secondly, there were several species reported which were questioned (*Pseudacris feriarum*, *Plethodon cylindraceus*). Thirdly, there were many species the authors of the current survey had limited experience seeing in the Piedmont of Virginia (ie. *Acris gryllus*,

Pseudacris ocularis, *Pseudacris brimleyi*, *Pseudacris nigrita*, *Hyla gratiosa*, *Anaxyrus quercicus*, and *Lithobates virgatipes*) that we kept coming back for additional observations. Coming back at different times of the year also suggested this would be a good test of how many different species were seen, and not seen, at different seasons.

From Table 2 it can be seen that 39% of all species (22/56) were observed only during one season (Early Spring, Late Spring or Summer) and would thus be missed if a survey was not done at that precise season. Some species (*Acris crepitans*, *Acris gryllus*, *Anaxyrus fowleri*, *A. terrestris*, *Lithobates sphenoccephalus*, *L. catesbeianus*, *L. clamitans*, *Ambystoma maculatum*, *Nerodia sipedon*, *Chelydra serpentina* and *Kinosternon subrubrum*) were found during every season surveyed. These species are either relatively abundant and easy to find, or frequent larger bodies of water which are fairly permanent making these species permanent residents and easier to find. Some species (*Pseudacris brimleyi*) were heard calling and rarely seen. They are extremely elusive, calling from inside large clumps of grass. If anurans have a short breeding season, their presence is even more difficult to document since detection depends on hearing the calling males, and not all surveys include night-time surveys when most anurans would be calling. If a survey were done only in one season, the species count would be less than if multiple seasons were utilized. This suggests it may be much more productive if VHS surveys were performed during different seasons, to gain a more accurate determination of what species are present in any given location. This is particularly true if the location is looking to determine a species list for their organization (park, WMA, etc.). Gibson (2023) made this point in an analysis of VHS surveys over 30 years that anurans “found in few surveys

usually have a restricted geographic distribution, early or late breeding cycles, specialized habitat requirements, and/or breeding requirements tied to heavy rainfall events.” The same argument can be applied to salamanders. Snakes are usually present in low densities and easily missed even if present.

Surveys during different seasons can also result in a more accurate estimation of numbers of any given species present in the area. As an example, Oak Toads were heard calling from a few sites during a survey in June 2020. However, a survey in July 2021, after a prolonged drought during June, and the passage of Tropical Storm Elsa with heavy rains, found Oak Toads calling from throughout BWWMA so we were almost never out of hearing of smaller or larger populations. We heard very large choruses from extensive temporary wetlands. We would have assumed Oak Toads were present but in small numbers from the 2020 visit, but know there are very large populations in multiple locations, from the 2021 visit. Likewise, Little Grass Frogs were observed and heard in small choruses at different times and places during these surveys. However, the huge number observed on 9 May 2024 in Seacorrie Swamp highlight the importance of Big Woods WMA to the preservation of this species. Big Woods WMA must hold the largest population in Virginia. Some species are rarely encountered at certain times of the year, but abundant at others. If population estimates, or natural history information is being sought, some seasons are much more productive than others.

There are two reports from Perry (2018) which we believe are possible misidentifications. *Pseudacris feriarum* was reported by calls but not observations, from site 1 at Big Woods WMA. We have visited this site numerous times both in the daytime

and at night. The only slow trill *Pseudacris* we observed was *Pseudacris nigrita*. The calls of the two species are similar. While *Pseudacris feriarum* is known from Sussex County, even within Big Woods WMA, according to the Virginia FWIS database, we believe the calls heard by Perry (2018) were *P. nigrita* rather than *P. feriarum*.

The second is a juvenile *Plethodon cylindraceus*. The only slimy salamander we have observed on any of these properties is *Plethodon chlorobryonis*. The photograph in Perry (2018) does have more spotting than is typical of *Plethodon chlorobryonis*, however, it is a variable trait. We would be more confident of the identification if the individual were an adult, and if more than one individual were found.

Big Woods and Flippo-Gentry WMAs and Big Woods State Forest is an extraordinarily important habitat and preserve for many species of amphibians and reptiles, especially anurans. We have found at least 22 of the 25 species reported for Sussex County. We are not aware of any other surveys in Virginia where this abundance of anurans has been documented. Figure 22, with data compiled from Gibson (2023), shows the number of anuran species reported from 60 VHS surveys between 1991 and 2022. The maximum number of anuran species from any VHS survey is 14. The previous record for the maximum number of anuran species on any survey was held by Roble et al. (2005). They recorded 17 species on the evening of 2 July 2003 during road cruising in Prince George, Sussex and Southampton Counties after tropical storm Bill passed through the area. The maximum number of species at any one site was 10, along St. Rt. 35 just south of Big Woods WMA in Southampton County. Sattler and Gibson (2007) in the same area on the evening of 14 June 2006 after tropical storm Alberto

passed, reported 11 anuran species in Greensville County and 14 species in Southampton County, for a total of 15 species altogether. While not on one date, the number of anuran species from the properties surveyed here sets a new record in Virginia with 22. In just one larger pond on the Flippo-Gentry WMA we have either heard or seen 16 anuran species in 2024 (*Acris crepitans*, *A. gryllus*, *Anaxyrus fowleri*, *A. quercicus*, *A. terrestris*, *Hyla chrysoscelis*, *H. gratiosa*, *H. femoralis*, *H. squirella*, *Gastrophryne carolinensis*, *Lithobates catesbeianus*, *L. clamitans*, *L. spinocephalus*, *Pseudacris crucifer*, *P. nigrita* and *Scaphiopus holbrookii*). This may set a record for the most anuran species observed at one site in Virginia. Southeastern Virginia houses the greatest

number of anuran species within the state. There are currently 28 anuran species recognized in Virginia (FWIS Database, 2024) with 25 reported for Sussex County. The next most populous county for anurans is Southampton with 24, immediately south of Sussex. Three counties and one city immediately to the east of Sussex and Southampton report more than 20 anuran species; Prince George (21), Surrey (22), Isle of Wight (21) and the City of Suffolk (23). No other counties in Virginia have 20 or more anuran species reported. Thus, southeastern Virginia is the center of anuran diversity, so this is the area where public and protected lands should be concentrated to safeguard anurans. It is fitting there is so much protected land in Sussex County to help preserve anurans in Virginia.

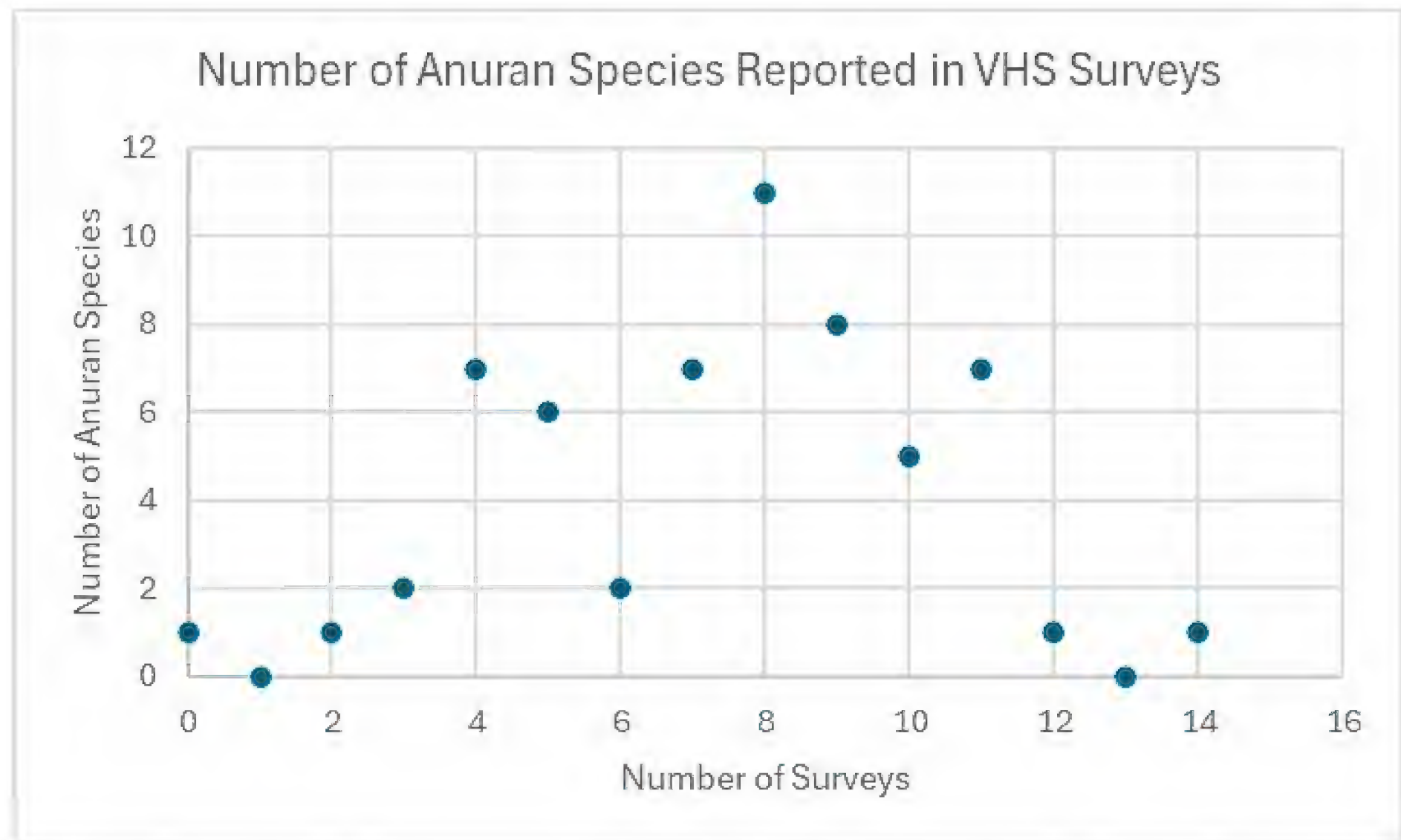


Figure 22. Number of Anuran Species reported from 60 VHS Surveys (data taken from Gibson (2023)).

The only species reported for Sussex County we have not documented on the WMAs are *Hyla versicolor*, *Anaxyrus americanus* and

possibly *Pseudacris feriarum*. We have previously discussed *Pseudacris feriarum*. The morphology of *Anaxyrus americanus*

and *A. terrestris* overlap, making identification very difficult. The calls are quite similar, differing primarily in duration. We have not seen molecular studies examining the range of these species in southeastern Virginia. We believe this would be quite beneficial in verifying their distribution in general, and their presence in Sussex County in particular. We have surveyed these properties numerous times during rains when *Hyla chrysoscelis* was calling. If *Hyla versicolor* were present, they should have been heard, leading us to conclude that while the Gray Treefrog is present in the county, it is not present on these properties.

Also, the number of individuals for many anurans is quite large. As mentioned previously, during some rain events the number of calling males is truly outstanding. We typically think that large bodies of water are the most important to anurans since they have the greatest chance to persist until tadpoles can metamorphose. However, during rain events we have found large numbers of anurans (*Acris*, *Hyla*, *Pseudacris* and *Gastrophryne*) breeding in waters only 10 cm or less in depth. There are many types of these smaller bodies of water that seem to be widely dispersed and plentiful that are heavily used by smaller anurans. We find breeding individuals and egg masses in roadside drainage ditches, logging equipment tire ruts and low spots in the gently rolling hills. This may be one reason for the large populations of anurans observed. These smaller bodies of water may be so numerous that the area can support such large anuran populations. The large populations of rare species such as Oak Toads and Little Grass Frogs (both are tiered species in Virginia) in Sussex County is particularly important for their preservation.

We also wish to emphasize the importance of night surveys in VHS events. Nighttime surveys are critical to fully document the species in an area. Species such as Barking Treefrogs, Oak Toads and Green Treefrogs seem to call only at night and may be missed during a daytime only survey. The only Eastern Spadefoots we encountered were on a road at night. Several snake species (*Agkistrodon Contortrix* and *Nerodia erythrogaster*) were found only at night. Surveying during the rain also will increase the number of species found as anurans are easier to find when calling and breeding, as are the snakes which hunt and consume them. The use of frogloggers during VHS surveys would likely increase the number of anurans reported if distributed prior to surveys, during pre-survey scouting the area for the most likely productive areas to search.

We wish to emphasize the importance of small and shallow depressions in the landscape to produce breeding sites for anurans. These public lands are being specifically managed to produce the pine savannahs needed as habitat for the federally-endangered *Dryobates borealis* (Red-cockaded Woodpecker). However, this is not incompatible with the habitat required for the large populations of several species of anurans, not found in large numbers anywhere else in Virginia. Big Woods WMA contains the largest populations of, and probably the only large populations of *Anaxyrus quercicus* (Oak Toads) and *Pseudacris ocularis* (Little Grass Frogs) in Virginia. Often, they are breeding in the small shallow depressions left by heavy equipment moving through the forest (Figure 22). These should not be viewed as blemishes in the landscape, but crucial habitat for maintaining these large populations of anurans. Their number and distribution should perhaps be increased over time and no effort made to reduce their depth

or number in future land management practices.



Figure 22. Small wetland produced by timber harvesting equipment in Flippo-Gentry WMA.

Acknowledgements

We wish to thank J.D. Kleopfer for helpful information on Big Woods and Flippo-Gentry Wildlife Management Areas throughout these surveys. These surveys were performed under Virginia Scientific Collecting Permit #2063666.

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Field Notes

***Gastrophryne carolinensis* (Eastern Narrow-mouthed Toad):** VA. Goochland County, 2835 Poorhouse Road. 28 June 2024. Christine Kenworthy.

County Record: Eastern Narrow-mouthed Toads are common in eastern Virginia with most records coming from counties east of Goochland

(<https://www.virginiaherpetologicalsociety.com/amphibians/frogsandtoads/eastern-narrow-mouthed-toad/index.php>). They are small, terrestrial toads with a distinctive fold of skin across the back of the head. On 28 June 2024 I went to skim our in-ground swimming pool and saw a toad swimming along the edge of the pool. I was able to scoop the animal out and sent a photograph to the VHS Herpetological Identification Page. I was informed the animal was an Eastern Narrow-mouthed Toad, and there was no previous record for Goochland County. The pool is on a hillside, away from a tree-line and about 100 meters from a small creek. The weather at the time was hot and overcast. A digital image was submitted to the VHS Archive (#833) as a voucher for this record.

Christine Kenworthy
Goochland County, VA



***Hyla cinerea* (Green Treefrog):** VA, Fairfax County, Huntley Meadows Park, 3701 Lockheed Blvd. Alexandria, and Prince William County, Neabsco Boardwalk 15125 Blackburn Road, Woodbridge. September 2019 to October 2024. Barbara J. Saffir, Mar Acevedo, Patrick Wamsley, Shumiao Wei, and Jerry Nissley.

Unusual coloration (axanthism): Aberrantly blue-colored green treefrogs have been documented at least since 2006 with one reported at Audubon's Corkscrew Camp Sanctuary in Naples Florida (<https://archive.naplesnews.com/news/environment/rare-blue-tree-frog-found-at-corkscrew-ep-405223862-345740502.html/>). Since then, blue-colored treefrogs have been reported on iNaturalist in nine states (Virginia, Maryland, North Carolina, South Carolina, Florida, Louisiana, Texas, Oklahoma, and Illinois). The first known documentation of an aberrantly blue-colored green treefrog in Virginia appears to have been by photographer Mar Acevedo at the Neabsco Boardwalk on 31 August 2019 (Pers. Comm.). Subsequently sightings of almost fully or partially blue-colored green treefrogs were documented at Huntley Meadows Park by Jerry Nissley on 16 September 2021 and others. Documented sightings continued sporadically at Huntley through 2023 and at Neabsco through 2024. Some of the sightings are documented on iNaturalist's "Aberrantly Blue Frogs" project run by the California Academy of Science's Rayna C. Bell (<https://www.inaturalist.org/projects/aberrantly-blue-frogs>). Bell said she started the iNaturalist project and her study of all types of aberrantly blue frogs worldwide in February 2020, prompted by Saffir's email to her about the

Virginia treefrog sightings. Her final study is expected to be published in 2025.

Blue-colored Green Treefrogs were documented with photographs at Neabsco Boardwalk by Barbara J. Saffir on 25 September 2024 (partially blue) and on 2 October 2024 by Shumiao Wei (almost completely blue). Although green treefrogs typically just change their color in shades of light to dark greens or browns, depending on temperature, the color of their perches, and/or other factors, these treefrogs displayed axanthism, a mutation that interferes with yellow pigments and causes the animal to appear blue. All of them appear a light turquoise-color blue in Virginia. Some animals show just small patches of blue while others are almost completely blue. A photo of one of the Green Treefrogs was submitted to the VHS Archive (#888) as a voucher.

Barbara J. Saffir
Fairfax, VA



***Hyla cinerea* (Green Treefrog)** VA: Prince William County, Neabsco Boardwalk, 15125 Blackburn Road, Woodbridge. 1 September 2024. Barbara J. Saffir.

Population Estimate: Green Treefrogs are found in all eastern Virginia counties and two western counties (https://www.Virginiaherpetologicalsociety.com/amphibians/frogs_andtoads/green-treefrog/index.php), but numbers have not been documented in any location to the author's knowledge. On Sept. 1, 2024, I conducted a survey of individual Green Treefrogs along the Neabsco Boardwalk after photographing them for several years. I counted 250 frogs within roughly 7 meters (20 feet) of the busy, 1320 meter (3/4-mile) long, raised wooden boardwalk. The treefrogs, which appeared to range from 3-6 cm (1.3 to 2.3 inches) (although several appeared to be even smaller) were mainly lime green. Fewer of the treefrogs appeared to be forest green, darker green, and a couple were brown. They typically were sleeping vertically on cattail (*Typha*) blades (and sometimes the cattail stalks), occasionally next to other treefrogs, and only moving to the opposite side of the blade when it got too warm and/or sunny. In the past I've seen several treefrogs didn't even move when handsome meadow katydids (*Orchelimum pulchellum*) and grasshoppers touched them or walked right over them. The treefrogs were also observed vertically and horizontally on the increasing number of giant ragweed (*Ambrosia trifida* L.), on Tidmarsh Amaranth (*Amaranthus cannabinus*), and to a lesser extent on other plants and grasses. Their presence was documented virtually along the entire boardwalk but there were denser clusters at several locations. As dusk approached, some finally began to awaken and change positions.

Three other surveys on Sept. 16, 20, and 26 confirmed that the 250 count was not an aberration and is more likely an undercount. The total area surveyed, approximately 7 meters wide along the 1320 m boardwalk, amounts to 0.74 hectares. This approximates 338 treefrogs per hectare. Extrapolating this data would appear to show that there are thousands of treefrogs in the Metz Wetlands even during the 2024 summer drought. While the treefrogs come out in the spring, other wildlife photographers and naturalists say they have historically observed the highest numbers from August through early October. As a comparison, when 250 were found at Neabsco, roughly a dozen were found at Huntley Meadows Park, 30 km (19 miles) away in Fairfax County, with a similar boardwalk. The treefrog count at Neabsco appeared to drop somewhat after giant ragweed and other plants that had overgrown a couple of sections of the boardwalk were cut in roughly 3 meter swaths during mid-September.

Barbara J. Saffir
Fairfax, VA

***Hyla squirella* (Squirrel Treefrog):** VA. Northumberland County, Kilmarnock, 330 Highwater Lane. (37.79125, -76.33252). 19 September 2024. 23 September 2024. 26 September 2024. October 6, 2024. Anne Parker

County Record: On September 19 at 12:45 pm, my son called me outside to see the treefrog that had jumped off the screen door when he opened it. I was surprised when iNaturalist suggested Squirrel Treefrog because the closest county on record is Mathews County to the south, which is two

counties removed from Northumberland. There are no Squirrel Treefrogs on record in Northumberland, Lancaster or Middlesex counties to the south. King William, Hanover and Goochland counties are currently the northernmost counties on record. Northumberland County is approximately equal to that northernmost range of the species, but separated by three counties to the west with no records (Richmond, Essex and King & Queen counties.) On September 23 at 7:23 am I saw two Squirrel Treefrogs near each other, one on my front door and the other on the wooden siding. Then again on September 26 at 4:54 pm I saw another Squirrel Treefrog on the wooden siding of my home. I came home on October 6 at 3:57 pm and found another Squirrel Treefrog sitting on my front door handle. The weather has mainly had highs in the 70s F during the day and lows in the 50s F at night. A digital photo of each of these five individuals was submitted to the VHS Archive (# 826) as a voucher for this observation.

Anne Parker
Kilmarnock, VA



***Ambystoma opacum* (Marbled Salamander):** VA, City of Richmond, Wetlands in James River Park System (37.545318, -77.511513). 8 December 2022. Isabella Canovas.

City Record: The Marbled Salamander is one of the smaller Ambystomids, and like all of them are infrequently seen outside their breeding season. For the Marbled Salamander this is the fall, typically late September into October (<https://www.virginiaherpetologicalsociety.com/amphibians/salamanders/index.html>). Their range in Virginia extends across the state, but they are more common in eastern counties than western. Here I report the first record from the City of Richmond. It was unusually warm on 8 December 2022 and I was flipping logs in the Wetlands area of the James River Park System looking for any activity around vernal pools when I came across a female Marbled Salamander. I saw the same individual, or one very similar, in the same vicinity on 8 February 2023. This is the first report for the City of Richmond, although they have been verified in all surrounding counties, so this record helps fill a gap in the distribution in central Virginia. A digital photo was deposited with the VHS Archive (#834) as a voucher.

Isabella Canovas
Richmond, VA



***Amphiuma means* (Two-toed Amphiuma):** VA, Chesterfield County, 12708 Kelsey Point Court, edge of Rieves Pond. 8 September 2024. George Atkinson.

County Record: The Amphiuma is a large semiaquatic salamander found in a variety of wetland habitats in southeastern Virginia. They prefer shallow heavily vegetated habitats ranging from drainage ditches to permanent ponds (<https://www.virginiaherpetologicalsociety.com/amphibians/salamanders/two-toed-amphiuma/index.php>). I live on Crossgate Road and was looking across Rieves Pond at a Great Blue Heron which I thought was eating a snake. I photographed the Heron and noted the prey was a large salamander rather than a snake. I entered the information into the VHS Herp ID page and sent a photograph to verify the identity of the salamander. This is the first report of a Two-toed Amphiuma from Chesterfield County and helps fill a gap in the distribution of the species along the western edge of its range. It has been found in Hanover County to the north and Dickenson and Prince George Counties to the

south. A digital photo was submitted to the VHS Archive (#835) as a voucher for this observation.

George Atkinson
Chesterfield Co., VA



both surrounding counties, so this record fills a gap in the known range in central Virginia, and adds the City of Richmond to the known locations. A digital photo was submitted to the VHS Archive (#829) as a voucher for the observation.

Henry Nase
Richmond, VA



***Eurycea cirrigera* (Southern Two-Lined Salamander):** VA. City of Richmond, Willow Oaks (37.188538,-78.311791). 30 September 2022. Henry Nase.

County Record: Southern Two-lined Salamanders are a semi-aquatic species and can be found in a variety of habitats throughout its range such as streams, pools, seeps, ditches and damp woods. (<https://virginiaherpetologicalsociety.com/amphibians/salamanders/southern-two-lined-salamander/index.php>).

In Virginia they have a state-wide distribution, being reported from 74 counties and 11 cities. On 30 September 2022 I was looking for salamanders under logs at James River Park during a rainstorm. I found four Southern Two-Lined Salamanders in the hour I was looking. They have been reported from

***Plethodon wehrlei* (Wehrle's Salamander)**

VA: City of Roanoke, Star Trail on Mill Mountain (37°14'56.8"N 79°55'48.3"W). 11 April 2024. Erin C. Anthony.

City Record: Wehrle's are known from twelve counties in the mountains of western Virginia. This includes Roanoke County and the City of Salem. While on a trip to Mill Mountain in Roanoke, two individuals were found on the Star Trail near the top of Mill Mountain under logs adjacent to the trail. The weather was rainy all day and the clouds sat on top of the mountain so that everything was shrouded in mist. The temperature was just over 16° C. A photograph of one individual has been submitted to the VHS archive (#827) as a voucher.

Erin C. Anthony

Spotsylvania County Public Schools
Post Oak Middle School
Spotsylvania VA



Siren intermedia intermedia
(Eastern Lesser Siren) VA.
Chesapeake City (36.76856 N, 76.43850 W) 11 October 2024. Caden M. Banks

City Record: The Eastern Lesser Siren (*Siren intermedia intermedia*) is limited to the coastal plain region of Virginia and can occupy a variety of permanent and semipermanent bodies of water ranging from floodplain pools to shallow, heavily vegetated sections of ponds with deep sediments that provide ample burrowing opportunities. They have been verified in 8 counties and 1 city in Virginia. (<https://www.virginiaherpetologicalsociety.com/amphibians/salamanders/eastern-lesser-siren/index.php>). Here is the first reported record for Chesapeake City.

On 11 October 2024 while monitoring a pipeline for Reptiles and Amphibians that crossed through the Great Dismal Swamp an Eastern Lesser Siren was uncovered in a previously excavated trench. The animal had 34 costal grooves confirming that the specimen is a lesser siren.. This observation fills in a gap in the eastern limits of the range of this species. A digital photo was submitted to the VHS Archive (# 837) as a voucher.

Caden Banks

Winchester, KY



***Heterodon platirhinos* (Hog-nosed Snake):** VA. Highland County, Co. Rt. 678, Machen Retreat and Conference Center (38.250011, -79.580417) elevation 589 m. May 2013. Kenley Leslie.

County Record: The Eastern Hog-nosed Snake has a statewide distribution in Virginia, reported from 83 of the 95 counties. It is noted for its behavior of acting like a cobra when threatened and “playing dead” if that fails to deter the perceived threat. It is also noted for its diet of toads and its ability to withstand the bufotoxins in the toad’s paratoid glands. This is a medium sized snake, reaching sizes just over a meter in length (Mitchell, J.C. 1994. The Reptiles of Virginia. Smithsonian Institution Press, Washington D.C. 352pp.). There are two color phases, the more typical light brown with dark blotches on the back, and the melanistic phase.

In May of 2013 I saw and photographed a Hog-nosed Snake at the Machen Retreat and Conference Center in Highland County. The property is off Bull Pasture Road, at the foot of Jack Mountain that is to the west, with the Bullpasture River to the east. I saw the snake on the road to the summer bunkhouses. It was on a slope before it bends to the right toward the bunkhouses. The road at that time was mostly packed shale with very little gravel. It was in the middle of the road. On either side of the road was low vegetation. I saw the snake as I walked down toward the bunkhouses. It was in the middle of the roadway which was about 10 feet wide. It was easy to see. It did not seem aggressive when I discovered it at first. It broadened its head and I thought it was either a rattlesnake or copperhead. But the head just did not look right to be either. It then did something, at that time, I thought was strange. It went limp. I guess it was playing dead. The snake never seemed to display aggressive behavior that I

have seen in other snakes. I then went to get a camera to take pictures. When I came back it had moved off the roadway about 3-4 meters from where it had been and that is where the pictures were taken. The shadows in the picture would indicate this was mid-morning. I think it was a cool day. The pictures would indicate that there was not bright sun. The snake was probably a meter long, and wide.

Hog-nosed Snakes are verified in all surrounding counties in Virginia (<https://www.virginiaherpetologicalsociety.com/reptiles/snakes/eastern-hog-nosed-snake/index.php>) and West Virginia (Green, N.B. and T.K. Pauley. 1987. Amphibians and Reptiles in West Virginia. University of Pittsburg Press, Pittsburg, PA. 241 pp.) so this record fills a notable gap in the distribution of this species. A digital photograph was submitted to the VHS (Archive #822) as a voucher for this observation.

Kenley Leslie
Stanton, VA



Virginia valeriae valeriae (Eastern Smooth Earthsnake): VA. Prince Edward County, Farmville (37.263581,-78.393275). 13 September 2023. Henry Nase.

County Record: *Virginia valeriae* is entirely terrestrial and inhabits hardwood forests, mixed hardwood-pine forests, pine woods, abandoned fields in various stages of succession, dry upland ridges, pastures, urban and suburban woodlots, forest-field ecotones, and moist lowlands. They can often be found under all manner of surface objects, such as boards, logs, trash, debris, and piles of leaves or straw. Much of the time is spent underground. (<https://virginiaherpetologicalsociety.com/reptiles/snakes/eastern-smooth-earthsnake/index.php>).

In Virginia they have a primarily eastern and central distribution, being reported from 47 counties and 12 cities. On 13 September 2023 I was walking on a paved path that has a pond on one side and a field and hardwood forest on the other side. I found a deceased *Virginia Valeria* on the edge of the path. There had recently been rain. They have been reported from the surrounding counties of Appomattox, Buckingham, Cumberland, and Amelia so this record fills a gap in the known range in central Virginia, and adds Prince Edward County to the known locations. A digital photo was submitted to the VHS Archive (#830) as a voucher for the observation.

Henry Nase
Farmville, VA



Sceloporus undulatus (Eastern Fence Lizard)
VA: City of Martinsville, near the end of Bethel Lane. (36°42'09.9"N 79°51'43.3"W).
23 June 2024. Erin C. and Matt Anthony

Matt Anthony and I were birding along an unnamed road. The end of Bethel Lane branches off into three roads one of which is currently unnamed. It was not marked as private property and seemed to mainly be a dumping ground for mattresses. The land was very open with red clay at the top of a hill overlooking the city of Martinsville. We were there around mid-day, and it was very hot. A fence lizard was seen sunning itself on the pile of mattresses. A photo was taken and submitted as voucher (VHS Archive # 838) for this new city record. The Eastern Fence Lizard is known from 89 counties and 18 cities (<https://www.virginiaherpetologicalsociety.com/reptiles/lizards/eastern-fence-lizard/index.php>) so this record helps fill one

of the few remaining gaps in the distribution in the state.

Erin C. Anthony

Post Oak Middle School
Science Department
Spotsylvania, VA 22553



***Chelydra serpentina* (Snapping Turtle):**
VA, City of Lexington, Woods Creek Park
(37°46'58.6"N; 79°27'08.7"W). 1 September
2024. Matthew Anthony and Erin C.
Anthony.

City Record: Snapping Turtles have a state-wide distribution in Virginia. They are found in most permanent bodies of water. An adult snapping turtle was observed in a pool of water just before the tiny dam-like structure in Woods Creek, in Woods Creek Park. It was a warm, clear day, and we sighted it in the early afternoon. After I took a voucher photo, it retreated into a deeper part of the creek where the turbidity obscured it from view. This park is part of a chain of parks along a paved walking path/bike trail. For a small section of the trail, it parallels Woods Creek running through the city of Lexington which is where we made the observation. The photo was submitted to the VHS Archive (#837) as a voucher for this observation.

Erin C. Anthony

Post Oak Middle School
Science Department
Spotsylvania, VA 22553



***Chelydra serpentina* (Snapping Turtle):**

VA. Henrico County, Curles Neck Road,
Henrico. (37.3662588; -77.2722940). 17
August 2024. Winston C. Marshall.

State Record: Snapping Turtles occur in all manner of aquatic systems, including ponds, lakes, streams, rivers, swamps, and freshwater and brackish marshes. Areas providing aquatic vegetation and cover in the form of stumps, muskrat lodges and burrows, overhanging ledges, and/or soft, deep, organic substrate have the largest populations. Basking occurs only sporadically. The activity season extends from late March through October, but Snapping Turtles can be found in water in any month of the year. Over 99% of known Virginia records are April-September. Terrestrial activity occurs during the nesting season and in other warm months (<https://www.virginiaherpetologicalsociety.com/reptiles/turtles/eastern-snapping-turtle/index.php>).

On 17 August 2024 at 11:30 AM, I trapped a mature male snapping turtle in a D-ring style live turtle trap (Commercial Trapping Permit #1866796). Weather at time of capture was 26.7 °C (80 °F) with sunny and clear conditions. The turtle was weighed on a certified scale at Green Top Sporting Goods in Ashland, Virginia. This turtle is a new state record for snapping turtle weight at 25.9 kg (57 lbs. 2 ounces) and had a straight-line carapace shell length of 457 mm (18"). The previous record was 23.13 kg (51 lbs.) (op cit) and 465 mm (18 1/3 in.).

On 22 August 2024 at 9:30 AM, the snapping turtle was released into the same body of water as being captured. Weather at time of release was 13.9°C (57°F) with sunny and clear conditions. The turtle was observed by State Herpetologist, John (J.D.) Kleopfer at the release site. Mr. Kleopfer confirmed the turtle's straight line carapace length of 18" and curve line carapace length of 18.5". The turtle shell was marked with two small holes to allow for future identification if recaptured. A photo of the snapping turtle was provided to the VHS Archive (#821) as a voucher for this new weight record.

Winston C. Marshall
Powhatan, Virginia



***Sternotherus odoratus* (Eastern Musk Turtle):** VA, City of Covington, 101 W Riverview Drive, (N 37° 46' 33.764"; W 79° 59' 18.712"). 25 September 2024. Jerry Morgan.

City Record: The Eastern Musk Turtle has a state-wide distribution, although there are few records in west central Virginia. On 25 September 2024 I was working in my garage when I saw a small turtle crawling across the concrete floor. I took out my cell phone and took a photo of the turtle and sent it to the VHS Herpetological Society's Identification Service. I was told the turtle was an Eastern Musk Turtle and there was no previous record for the City of Covington. The temperature was about 21°C with clear skies. The garage is about 30 meters from the Jackson River.

The Musk Turtle has not been reported from Allegheny County which surrounds Covington, or Bath County to the north, Craig County to the south or Botetourt County to the east, although it has in Greenbrier County in West Virginia (Green, N.B. and T.K. Pauley. 1987. Amphibians and Reptiles in West Virginia. University of Pittsburgh Press, Pittsburgh, PA 241 pp.) to the west. This record helps fill a gap in the distribution along the western edge of Virginia. A digital photo was submitted to the VHS Archive (#836) as a voucher for this record.

Jerry Morgan
Covington, VA



Sternotherus odoratus (Eastern Musk Turtle):
VA. Lunenburg County, Victoria, Nottoway River below dam at Nottoway Falls Reservoir (37.044668,-78.148851). 26 April 2022. Henry Nase.

County Record: Eastern Musk Turtles are a highly aquatic turtle that seldom wander far from water. It has been found in ponds, lakes, swamps, ditches, streams, and rivers. It does not occur in brackish water, as they cannot

tolerate salt water. (<https://virginiaherpetologicalsociety.com/reptiles/turtles/stinkpot/index.php>).

In Virginia they have a state-wide distribution, being reported from 67 counties and 12 cities. On 26 April 2022 I was walking the bank and shallow edges of the Nottoway River below the dam at Nottoway Falls Reservoir. I saw an Eastern Musk Turtle swimming in the shallows and caught and photographed it. They have been reported from all surrounding counties, so this record fills a gap in the known range in central Virginia, and adds Lunenburg County to the known locations. A digital photo was submitted to the VHS Archive (#831) as a voucher for the observation.

Henry Nase
Victoria, VA



***Trachemys scripta elegans* (Red-eared Slider):** VA. Campbell Co., Lake Hydaway (37° 20' 19.9"N; 79° 08' 57.5"W). 4 September 2024. Joshua Sorenson and Paul Sattler.

County Record: The Red-eared Slider has been widely introduced in many locations in Virginia and is considered by the Virginia Department of Wildlife Resources to be naturalized with breeding populations located in various locations around the state. On 4 September 2024, as part of an Honors Project for Vertebrate Natural History, we trapped an adult Red-eared Slider from Lake Hydaway, Liberty University's Field Station on the eastern side of Cander Mountain in Campbell County. Lake Hydaway is a recreational site for the university and area, visited by large numbers of people during most seasons of the year. It is home to a population of Red-bellied Cooters, *Pseudemys rubriventris* (Sattler, P. 2012. *Pseudemys rubriventris*, Field Note. *Catesbeiana* 32(1):34.) introduced in the 1990s, so the presence of another introduced species is not surprising. There has only been one individual observed to date so whether the Red-eared Slider persists in Lake Hydaway is still to be determined. A photo of the animal was deposited in the VHS Archive (#828) as a voucher for this record.

Joshua Sorenson and Paul Sattler
Biology Department
Liberty University
Lynchburg, VA



***Trachemys scripta scripta* (Yellow-Bellied Slider):** VA. City of Richmond, James River Park, Willow Oaks (37.547228,-77.511025). 26 March 2023. Henry Nase.

City Record: Yellow-Bellied Sliders inhabit all manner of freshwater habitats in southeastern Virginia, from lakes and ponds to rivers, ditches, marshes, bays, and swamps. (<https://virginiaherpetologicalsociety.com/reptiles/turtles/yellow-bellied-slider/index.php>). In Virginia they have a primarily southeastern distribution, being reported from 17 counties and 9 cities. On 26 March 2023 I was on a walk at James River Park and while crossing a small bridge over a side creek I observed a Yellow-Bellied Slider sunning on a log. They have been reported from both surrounding counties, so this record fills a gap in the known range in central Virginia, and adds the City of Richmond to the known locations. A digital photo was submitted to the VHS Archive (#832) as a voucher for the observation.

Henry Nase
Richmond, VA



President's Corner

A formal hello to fellow herp enthusiasts and members of the Virginia Herpetological Society! Although I am new to the presidency, you may already know me from my tenure as Vice President last term. I am excited to not only be a part of this wonderful group, but also to witness the continued growth of this community that centers around the animals I hold near and dear.

For those of you who don't already know me outside the society, I am also the Assistant Curator of Herpetology at the Virginia Museum of Natural History. My position at the museum intersects directly with the mission of the VHS—to connect communities and institutions in Virginia with ongoing reptile and amphibian conservation through research, and education, and to foster appreciation for the incredible diversity of species we have in the Commonwealth. Currently, I maintain an active local research program in southwest Virginia. I am happy to also introduce *Marshall Boyd*, Research Technician of Vertebrate Biology at the VMNH, as the new VHS Vice President.

This past year has seen many successful events so far: Jason Gibson (Survey Chair), Caroline Seitz (Education Chair) and other members of leadership led a diverse array of herpetological bioblitz events (i.e., “HerpBlitz”) and Herp hikes across the state, including Powhatan Wildlife Management Area (Powhatan County), South Run Park (Fairfax County) and Pocahontas State Park (Chesterfield County). I led the Annual Spring Survey at the newly established Sweet Run State Park (Loudoun County), attended by 30+ volunteers, with >50 observations of 21 species. We are so grateful for every member that came out to participate, and a special thank you to *Kevin Bowman*, Sweet Run State Park Manager, and *Suzanne*

Grobbe, Office Manager, for facilitating. Additional thanks to *Larry Mendoza* for sharing his knowledge of snakes, *Paul Sattler* (Journal Editor) and *Jason Gibson* (Survey Chair) for lending their expertise in frog calls and amphibian identifications, and *Susan Watson* (Permit Chair) for helping to secure permits for all of our events!

We had an incredible Fall meeting at the Department of Wildlife Resource Headquarters attended by over 50 members! The conference included a variety of top-tier herpetological talks spanning diverse topics such as the Department of Defense Partners in Reptile and Amphibian Conservation, silviculture and salamanders, and terrapin nesting ground protection. We had one of our most successful live auction events, the proceeds of which will support the initiatives of the VHS. We were happy to hear a talk about snake skin microbiome research from our 2024 grant recipient, *Lauren Fuchs* (George Mason University), and look forward to reviewing new grant submissions in the 2025 award period. Thank you to all of our speakers for their contributions, as well as *Tammy Tideswell*, *Arnold Patchman*, and *Matthew Huntley*, the 2024 VHS Photo Contest winners!

During this presidency, I am excited for the VHS to explore opportunities to extend the reach of our society. The executive committee has been actively pursuing new collaborations with other non-profits organizations that share our commitment to conservation, education and research in the region. Already, the *very first* Joint Meeting of the VHS and the North Carolina Herpetological Society is on the books for May 2025, and we hope to see you there!

Other goals include increasing the impact of our community science conservation projects such as our box turtle and spadefoot reporting initiatives. Thanks to generous donations and increased memberships (expertly managed by *Matthew Close*, Treasurer) we will be able to support the purchase of new audio logging equipment this calendar year to aid in better frog detection during survey events throughout the state. We have also increased the number of educational outreach events this year—a big thanks to *Caroline Seitz* and the 23 Education Committee members for their efforts on this front! Over 45 programs were performed in 2023-2024, reaching over 8,335 community members. In addition to developing new digital and print resources and recruiting new volunteers, we are excited to continue building our education program.

Here's to lots of exciting new discoveries and herp records in the coming year!

Arianna Kuhn,
VHS President



Minutes of Meeting
Virginia Herpetological Society
Fall Meeting DWR Headquarters
Henrico, Virginia
9 November 2024

The 2024 Virginia Herpetological Business Meeting was held at the Department of Wildlife Resources (DWR) facility in Richmond, Virginia on November 9th, 2024. Committee members in attendance were Vice President Arianna Kuhn, Treasurer Matt Close, Secretary and conservation chair Yohn Sutton, Education chair Caroline Seitz, *Catesbeiana* Journal committee Paul Sattler, permits committee Susan Watson, Herpblitz and Survey chair Jason Gibson, Website chair John White, Outreach committee Kelly Geer, Grants chair Kory Steele, and Bylaws committee Erin Anthony.

Leadership for the society was at the top of the agenda, with the resignation of President John Orr. A vote amongst the committee decided that according to “Virginia Herpetological Society Bylaws” Article III, sec. 1d, “if an officer is removed from office, it is declared vacant. If the office is President, then the Vice President will assume the Presidency.” A nomination for Arianna Kuhn to assume the role as President with a second motioned was voted upon. More than 2/3rds of the society voted to approve, with no objections or abstention. Congratulations to Arianna for assuming the role of President of the VHS for the remaining one-year term.

A vacancy in the Vice President role occurred with Arianna’s promotion and there was a motion to nominate Marshall Boyd and Erin Anthony to fill the role. Erin withdrew her nomination, creating a second request to members for nominations. With no objection or contest, Marshall Boyd was nominated with a second to the Vice President position. A majority of these present approved with no

objections or abstention. Congratulations to Marshall for assuming the role of Vice President for the remaining one-year term.

The next item discussed was collaboration with the North Carolina Herpetological Society and holding joint meetings and potentially surveys. The objective is to include a neighboring herpetological society with similar species, and to broaden location suggestions for future surveys and fieldtrips. Having a joint meeting or session could increase the speaker participation and allow NCHS to collaborate with the VHS structured program. Suggestions for locations for joint meetings were: Greensboro Science Center, Danville Science Center, and Virginia Museum of Natural History. Survey proposals were: Great Dismal Swamp Wildlife Refuge (VA), Dismal Swamp State Park (NC), Merchants Mill State Park (NC), Fairystone State Park (VA), Back Bay National Wildlife Refuge (VA) and False Cape State Park (VA). The proposed scheduling for future spring surveys and meetings would include having the business meeting on the Saturday the week of the survey, with Sunday and Monday being the actual survey slots. The committee considered the motions and will reconvene at a later meeting.

The treasurer’s report, presented by Matt Close, had been itemized for *Catesbeiana*. A proposed budget for 2024-25 was introduced at the spring meeting and voted upon at the fall proceedings. Estimation of the budget is based on a five-year data set. The committee approved the proposal by more than two-thirds without disapproval or abstention.

Another vote was needed to either move a Certificate of Deposit into the society checking account, or to continue with another five-month CD renewal. The renewal of the CD would further increase the total balance of the society through the four percent interest obtained. The committee voted to approve the continuation of the Certificate of Deposit with no disapproval or abstentions. Monies in the current paypal account will be migrated for any refunds needed to members after the meeting ends. The treasurer has issued a credit card to the education committee chair for future use on approved tools for outreach programs due to the high productivity of this committee. Future proposals for society funding will be considered for conservation efforts, programs, and state supported conservation.

The Education and Outreach Committees will work in partnership to strengthen the outreach program efforts. Kelly Geer will continue with membership duties. There have been forty-five education programs accomplished that have reached 8,335 individuals. The full education report will be available in *Catesbeiana*. The committee will explore using equipment such as frog loggers to enhance informational value of surveys done. The cost for each logger is estimated at \$700.00; the request is for three, but the need would be closer to five. There was a motion to vote for acquiring at least three loggers, with at least two-thirds approval to pass and no disapproval or abstention. A suggestion to apply for a grant was made by the grants committee. With the approval to acquire loggers, our President, Ariana, advocated for an inventory location catalog. With various members having VHS supplies throughout the state, a catalog would help increase communication for members that need supplies before surveys, fieldtrips, or bioblitzes. The secretary offered to assist with creating a google document to share

with the committee to list supply and tool locations.

Erin Anthony discussed work on editing the Articles of Incorporation and bylaws. Most of the changes to the articles and amendments were to be more concise and to reflect current committee operations. Edits of wording in the bylaws must be voted upon by the committee with a majority vote. Article II, section 4 of the Articles of Incorporation proposal to remove the last portion of how to educate public and members was voted upon, receiving full approval to change with no opposition. The members section of the bylaws, Article II, section 2 edit from “general” to “business” was voted with full approval. The proposal to remove additional duties of the Vice President from selecting meeting sites in Article III, section 4 of the by-laws was motioned with full approval, and no opposition or abstention. The duties of the newsletter editor in sections 5 and 6 were revised to support current practices within the society. Though there is a vacancy in the position, the committee fully supported and approved the revision to the sections without opposition or abstention. Article V, section 4 and 5 separated the duties of secretary and treasurer. The motion to remove the treasurer from counting votes of the election and having the secretary and treasurer removed from informing elected candidates of their election was approved without opposition. The last motion to remove the VHS seal from Article IX was denied by majority vote.

Due to timing constraint, the meeting was then adjourned and the 2024 Virginia Herpetological Society Fall Meeting started promptly.

Yohn Sutton
VHS Secretary

**Virginia Herpetological Society
Treasurer's Report
December 11, 2024**

| | | |
|--|----|------------------|
| Previous Balance- June 28, 2024 | \$ | 14,296.64 |
| *Certificate of Deposit-Truist Bank (matured 11/14/24) | \$ | 10,288.26 |

Receipts

| | | |
|---|----|-----------|
| Dues | \$ | 3, 607.27 |
| Donations (General, One-time and recurring) | \$ | 1,318.50 |
| Fall Meeting (Auctions, Merch, Meeting Donations) | \$ | 2,508.00 |
| *CD interest | \$ | 191.50 |

Expenses

| | | |
|-------------------------------------|----|----------|
| Operational Expenses | | |
| Little Green Light | \$ | 486.00 |
| Fall Meeting | \$ | 908.29 |
| Education and Outreach | \$ | 1,502.92 |
| VHS Logo T-shirts | \$ | 2,276.78 |
| Awards and Recognition | \$ | 175.00 |
| Postage | \$ | 77.78 |
| Service Fees (Paypal, Stripe, etc.) | \$ | 249.89 |

| | | |
|------------------------------------|----|-----------|
| Current Gross Balance (12/11/2024) | \$ | 26,533.51 |
|------------------------------------|----|-----------|

| | | |
|--|----|-----------|
| *Certificate of Deposit-Truist Bank (matures 04/18/25) | \$ | 10,479.76 |
|--|----|-----------|

| | | |
|----------------------------------|-----------|-------------------|
| Current Available Balance | \$ | 16, 053.75 |
|----------------------------------|-----------|-------------------|

VHS Memberships (dues current)

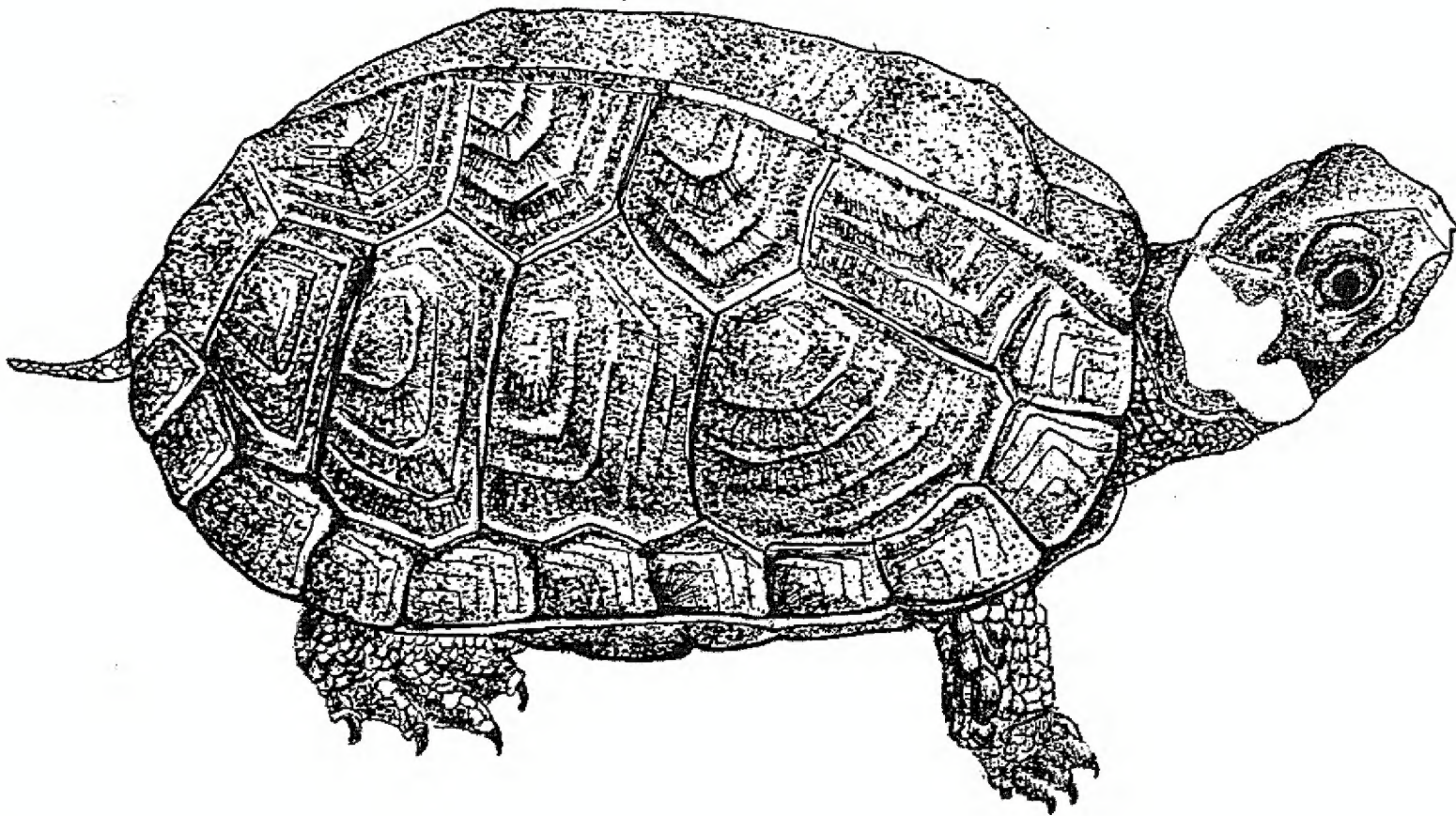
Regular: 325

Student: 41

Lifetime: 106

Total 472

Matthew Close
VHS Treasurer



Clemmys muhlenbergii mmp'97

Field Notes

The Field Notes section of *Catesbeiana* provides a means for publishing natural history information on Virginia's amphibians and reptiles that does not lend itself to full-length articles. Observations on geographic distribution, ecology, reproduction, phenology, behavior, and other topics are welcomed. Field Notes will usually concern a single species. The format of the reports is: scientific name (followed by common name in parentheses), state abbreviation (VA), county and location, date(s) of observation, observer(s), data and observations. The name(s) and address(es) of the author(s) should appear one line below the report. Consult the editor if your information does not readily fit this format. **All Field Notes must include a brief statement explaining the significance of the record** (e.g., new county record) **or observation** (e.g., unusual or rarely observed behavior, extremely early or late seasonal record, abnormal coloration, etc.). Submissions that fail to include this information are subject to rejection. Relevant literature should be cited in the body of the text (see Field Notes in this issue for proper format). All submissions will be reviewed by the editor (and one other person if deemed necessary) and revised as needed pending consultation with the author(s).

If the Field Note contains information on a **new county (or state) record, verification is required in the form of a voucher specimen** deposited in a permanent museum (e.g., Virginia Museum of Natural History) or a **photograph** (print, slide, or digital image) **or recording** (cassette tape or digital recording of anuran calls) deposited in the archives of the Virginia Herpetological Society. Photographs and recordings should be sent to the editor for verification and archiving purposes; the identity of voucher specimens must be confirmed by a museum curator or other qualified person. Include the specimen number if it has been catalogued. Prospective authors of distribution reports should consult Mitchell and Reay (1999. *Atlas of Amphibians and Reptiles in Virginia*), Mitchell (1994. *The Reptiles of Virginia*), and Tobey (1985. *Virginia's Amphibians and Reptiles: A Distributional Survey*) [**both atlases are available on-line on the VHS website**] as well as other recent literature to determine if they may have a new county record. New distribution records from large cities that formerly constituted counties (Chesapeake, Hampton, Newport News, Suffolk, and Virginia Beach) are acceptable, but records from smaller cities located within the boundaries of an adjoining county will only be published if the species has not been recorded from that county. Species identification for observational records (e.g., behavior) should be verified by a second person whenever possible.

PHOTOGRAPHS

High contrast photographs (prints, slides, or digital images) of amphibians and reptiles will be considered for publication if they are of good quality and are relevant to an accompanying article or field note. Digital images are preferred. Published photographs will be deposited in the Virginia Herpetological Society Archives.

Paul Sattler, Editor
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Liberty University
1971 University Blvd.
Lynchburg, Virginia 24515